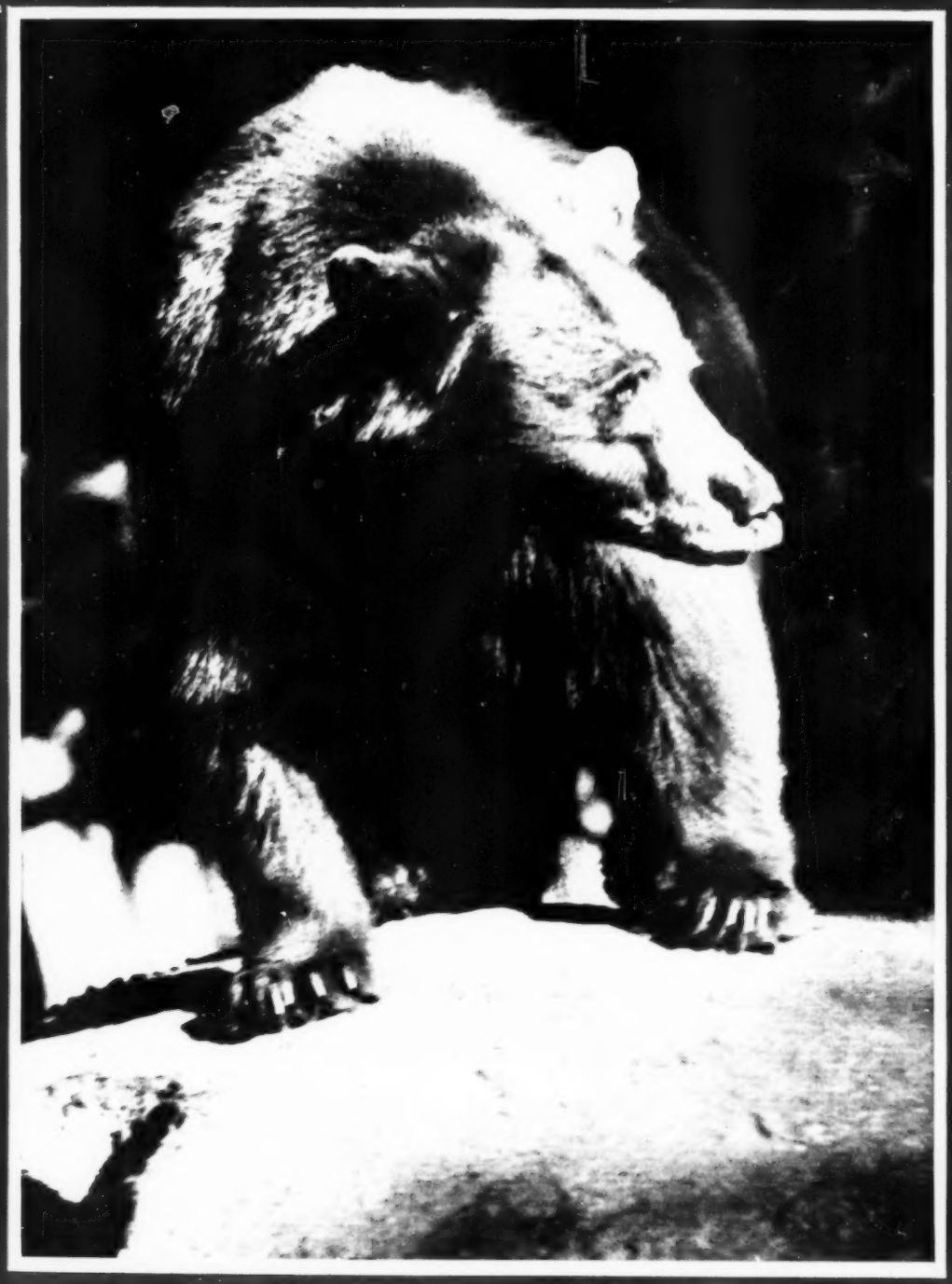
American FORESTS



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CONTENTS

THE COVER
"Grouch"—At Home in Sequoia National Park
Photograph by LOYD COOPER

WILDWOOD MAJESTY
By ARCHIBALD RUTLEDGE 491

THE TRAGEDY OF BANDON
By STEWART HOLBROOK 494

JOSHUA TREE FOREST
By ROBERT O. FOOTE 498

FORESTRY AND FLOODS IN THE TENNESSEE VALLEY
By EDWARD C. M. RICHARDS 500

PARKS FOR THE MILLIONS
By CONRAD L. WIRTH 505

THE HALL OF FAME FOR TREES
The De La Ronde Oaks 508
The Beatty Catalpa 509

A NORTH AMERICAN MARCO POLO
By DAREL MCCONKEY 510

WILDLIFE HAS A SENSE OF DIRECTION
By E. A. MCILHENNY 512

EDITORIAL
On to Victory 515

FIELD AND FOREST FOR BOYS AND GIRLS
State Trees
By ALETHA M. BONNER 516

TREES AND THEIR USES
No. 19—Bur Oak
Drawn by CALVIN FADER 517

BUR OAK (Tree Series) 518

AROUND THE STATES 520

ASK THE FORESTER 525

BOOK REVIEWS 526

SAPLING SAM'S COLUMN 527

THE MAPLE
Poem by CATHERINE L. BARKER 531

MATURITY
Poem by EDITH ANISFIELD WOLF 533

"WHO'S WHO" AMONG OUR AUTHORS 536

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IN THE DOMAIN OF HIS WILDWOOD MAJESTY — AN ANCIENT LIVE OAK OF THE CAROLINA "LOW COUNTRY".

AMERICAN FORESTS

Vol. 42 NOVEMBER, 1936 No. 11

WILDWOOD MAJESTY

By ARCHIBALD RUTLEDGE

AS I pushed my little cypress canoe up the choked channel of Flag Creek, one of the tidal estuaries that invade the mouldering yet tender gloom of the great delta of the Santee River, the stars were still brilliant overhead, and there was no sound save the weird intoning of the barred owls, aware that daybreak was at hand. Landing on Holly Ridge, I made my way through the dusky but familiar woods to a station near the borders of the great delta swamp. It was late March in the Carolina coastal country, and I had come out before dawn to call up a wild gobbler in order that I might observe him, not merely as he is, but as he is when the rapturous season of mating and of love has transformed him from the shy lurker in the dim solitudes to the truly bold and magnificent king of the wilderness.

Coming to a great fallen log overrun with smilax and jasmine vines, I stationed myself behind this shield to await developments. By that time a wan day was breaking, suffusing the lonely swamp with pearly lights. At all other times one of the most silent of the children of the forest, at the beginning of the mating season the gobbler will gobble at daylight from his roost, will even strut up and down a limb, and will fly to a call. But the nicest human psychology must be used in alluring his wildwood majesty. The gobbler is a great aristocrat; he is an instinctive patrician. He desires what perhaps most men truly desire: to be allured by a lost princess, a timid enchantress, a creature instinct with mystery and shadowy avoidance. If the call is too bold and obvious; if it is repeated too often; if its note has not the X-quality, the great bird will not come—not so much because he is afraid as because he is disgusted. A good call will hint of sorcery, and will utter unutterable things. For that reason I call mine "Miss Seduction", and with her help I rarely have any trouble in bringing this most wary and splendid bird close to me.

As the light broadened, dark clouds of red-winged blackbirds passed overhead; woodducks fleeted by on whistling wings; a cardinal's note sounded. Then, high in the glimmering heavens, a Cooper's hawk gave a screaming call. This was immediately answered by a gobbler in the swamp, about a quarter of a mile from me. From that moment it seemed that the mournful reaches of the vast swamp held nothing but wild turkeys. I know that I distinguished the gobbling of at least five distinct birds. It was not yet time to call. Possessed with a dignity befitting royalty, they will not come to ground until they are ready; and the time to win them to you from the trees is just when they are coming down anyhow. It was fascinating, waiting there with the primeval world about me, and with nature not much changed from the days when the Seminoles roamed these same wilds or from the days when Columbus came. From anything savoring of artificialty, anything suggesting the incursion of man, the deep swamp on every side for miles was wholly free. I might have been in the morasses of Rhodesia, or in the jungles of the Amazon.

The strident and utterly wild chorus of gobbling abated somewhat; and now the light was clear enough for me to see a great distance, and to discern objects in the trees outlined against the radiant sky. At last I saw one gobbler on a cypress, black against the dawning; then another on a massive limb of a big pine. Watching them, I touched my call, which, heard by a man at two hundred yards, will be heard by a wild turkey for half a mile. The effect of the pleading note was almost instantaneous. Both gobblers straightened up, peered, listened, and then gobbled magnificently. One of them, a little off balance, tried to strut as he paraded on a limb. I knew that at least one of them would come to me. But I waited full five minutes before calling again. At the soft pathos of the lone and tender note, one of the birds immediately launched himself into flight, heading as straight for me as if he had been drawn by a magnet; he was drawn by the most powerful magnet in the world—the mating instinct.

There may be in wild nature more superb spectacles than a full grown wild gobbler in flight; but that at least completely satisfies the heart with its native power, its ponderous grace, its thrilling precision and triumphant beauty. On he came. Two hundred yards from me he set his wide and swarthy wings, volplaned hurtling out of the heavens, headed downward, banked, and came to earth in a little natural arena of tiny canes not thirty yards from me. On alighting from any kind of flight, a wild turkey is likely to stand absolutely statuesque for some time, making sure of his environment, making sure that no enemies are near. So this gobbler stood motionless in the sumptuous glory of his full nuptual plumage. The feathers of his body were a brilliant metallic bronze, with red, green and gold reflections, all softly shimmering. His beautiful long tail was chestnut-colored, with reddish lights glinting in it, and barred black. His beard hung full eight inches over his arching breast. His legs and feet were red. But the mere physical description of him approaches but faintly a just appraisal of his size, beauty and regal presence, fully to appreciate which a man must feel and see. The power to convey what he senses is hardly his.

There stood this lover of the wildwoods, looking with eager yet poised and dignified longing for the enchantress who had allured him. Before he moved, the second gobbler came winging magnificently through the dusky cypresses and tupelos, coming to the ground not twenty

feet away from the first bird. Here, I knew, were rival cavaliers for a lady's favor. And what I expected soon happened. With certain warlike preliminaries, the two great birds, with an instinct as ancient as life itself, began a furious combat, their royal bodies thudding together with onset, their long spurs brought cruelly into play. After a few moments the smaller antagonist yielded the field, whereupon the big gobbler stepped forward expectantly for his prize of the tournament. Now, I have seen disgust on the human countenance; but nothing that equalled the expression on the face of that old wildwood victor when, expecting a Queen of Love and Beauty, he saw *me*. With a jerking run he dashed from me, took wing, and soon was lost among the glimmering trees of the swamp.

Nearly all birds have the power to rise instantly from the ground; but it has been my observation that the wild turkey's weight is so great that he has to taxi first, like an airplane. The grouse hurtles wildly from the ground, in high gear; and the wild duck does the same thing from the water. But the turkey always has to have a little momentum of being under way before he can take the air.

Not once but scores of times I have thus called wild turkeys to me in order to study their appearance and their behavior. And the thrill of seeing one of these grand old patricians in his wilderness home never wanes.

While, in positively amazing fashion, the whitetail deer will often thrive close to civilization, it is not so with the wild turkey. It is true that this splendid bird may now be found in the wilder mountains of several of the eastern states, notably Pennsylvania, Virginia and West Virginia; and while I have seen the birds in these places, rarely have I found them to be of the true wild strain. Many of them have been raised in captivity by game commissions, and then liberated; some of them have interbred with the roving tame turkeys of the mountaineers. Most of them have a good deal of white and gray in their plumage, and they have lost some of the scintillating wariness, some of the patrician elegance that we always should justly associate with the true wild turkey. Indeed, if you are seeking the real thing, you will hardly find it short of the great swamps of the deep South. That is true turkey-gobbler land. There this magnificent species still reigns in regal superiority and in original nobility of blood and bearing.

When William Bartram, the famous Philadelphia naturalist, traveled through the South in the year 1760, often camping in the wildwoods, he reports that his morning slumbers were regularly broken by "ye din of ye wild turkeys, which makes ye forest resound for hundreds of miles around." Despite the exaggerated credit that he gives his sense of hearing, wild turkeys were then abundant throughout eastern North America, from Ontario to the Gulf. Thomas Morton, writing in Massachusetts in 1632, tells us: "Turkies there are, which divers times in great flocks have sallied by our doors." He asked the Indians what numbers they found in the woods, and they answered, "*neent metawna*"—more than they could count. William Wood, writing of Massachusetts of about the same period as Morton, says: "The Turkey is a very large bird withal. He hath the use of his long legs so ready that he can run as a Dogge, and fly as well as a goose. The price of a good turkey-cock is four shillings; and he is well worth it, for he may be in weight forty pounds."

Existing in early colonial days in almost incredible numbers, in flocks which sometimes numbered more than a hundred, by the beginning of the nineteenth century this noble bird was practically exterminated from the New England States, and, indeed, from the greater part of its range in the East. The last wild turkey seen in Massachusetts was in 1850. However, in the National Capital, as late as 1834, wild turkeys could be bought for five cents apiece! Audubon, in his *Travels*, describes vast flocks swimming the Arkansas River.

I recall a very unusual experience with a gobbler that chose swimming as his method of escape. It was in a time of flood, when all the delta country was submerged to a depth of nearly twenty feet. At the time I was out in a boat to try to rescue some stock. In the middle of the delta, with the mainland a mile away in either direction, there is a high pine ridge; and toward this I directed my course. As I drew near, I saw that it was still out of water, and that it was peopled by a host of promiscuous refugees: wild hogs, a deer, innumerable swamp rabbits, some of my cattle, and one superb old wild gobbler. The stretch of high land exposed was some two hundred yards long. As I landed, the creatures wild and semi-wild made way for me, but few plunged into the flood except two old bucks of the seagoing variety, who straightway headed for the far-off mainland. The gobbler walked with wary dignity to the far tip of the ridge, where I saw him step stealthily behind a huge pine in the edge of the brimming tide. As he did not take wing as I drew near, I thought I had an excellent chance to be a hero by catching a wild turkey alive.

Down on my stomach I crawled up to the pine. Still there was no sign of the gobbler's having moved. With infinite caution I peered round the giant bole of the tree, first on one side and then on the other. He was not there. Looking off over the affluent rupture of the tawny freshet, I saw the great bird swimming away. He either thought it safer to swim or else he did not care to risk the long flight to the mainland. However, from that same ridge, in time of flood, I have seen a wild gobbler pitch out of a giant pine and fly the whole distance to the mainland. In all studies of wildlife, it seems to me that far too little account is taken of the extraordinary variation in individuals of the same species. The turkey that made that heroic flight simply had the strength and the temerity to do it. I find the children of nature of the same species subject to about as much variation as I find in races of mankind. No two are exactly alike; and probably they do not think and feel alike either. For that reason I always am prepared to be surprised, even by the most familiar birds and animals; and it is this iridescence of behavior that lends to all life much of the charm that is due to originality and differing qualities.

Of the characteristics of the original wild turkey it is possible to speak with assurance; for we have Audubon's great pictures to guide us. And in the deep swamps of Dixieland the true wild turkey has not changed his appearance since that matchless naturalist found him in his primeval state. As to weight, the mature wild gobbler, who will live to be twenty years old, rarely goes over twenty pounds. I have weighed one of twenty-three pounds, but he was in every sense an exceptional bird. Beards often appear in hens as well as in gobblers. The old gobblers grow prodigious spurs, and often they grow as many as two or even three beards. As to contour, the mature wild turkey is, especially when on the alert, with all his feathers drawn in, a comparatively slender bird; and always impresses the observer with his hair-trigger wariness and his masterly grace. As to color, the head is distinctly blue. So vividly iridescent is the plumage that the color of a wild turkey will vary greatly according to the position and the light in which he is seen. I have long noticed that when a flock is approaching, all the birds look startlingly black; when moving away, especially if sunlight be upon them, they look a tawny, almost a silver, gray. By remembering this fact, the observer in the wildwoods can tell at a great distance whether tur-

keys are approaching him or are retreating from him.

We are accustomed to think of most wild game as equally wary; but, really, the different kinds vary greatly in their degree of alertness; and certain individuals of a species are far more peering, suspicious, and tiptoey than others. Some creatures depend on certain senses for their protection; thus the whitehall deer counts on his nose to know—relying on his eyes only in a secondary fashion—as they are completely outclassed by the wild sensitiveness of his nose and his ears. While sitting motionless in the forest, with the wind blowing from a buck to me, I have its carrion a full mile away; but I have had wild turkeys undisturbed by the fact that I was walking within three hundred yards of them. And for their full power of vision they seem very dependent upon good light, whereas a deer can apparently see as well in the black dark as in sunlight.

Wild turkeys have a regular range. Sometimes this is of great extent, but they usually make a daily round of it. If the observer knows the country, and can plot this range, he is certain to get a chance to see the great birds. On my plantation I have repeatedly seen turkeys simply by waiting at a certain hour at a certain place. I just

Photograph by Elizabeth Thompson

His Wildwood Majesty, the Wild Turkey, does not thrive close to civilization. Because of this, birds of the true wild strain are today found chiefly in the great swamps of the Deep South. There is true turkey-gobbler land. There this magnificent species still reigns in regal superiority and in original nobility of blood and bearing. The above photograph was made at Sea Island, Georgia.

more than once had an antlered monarch walk up to within fifteen feet of me. Had I made a sound, or had the wind been in his favor, he would hardly have come within sight. Under conditions favorable to the carrying of a scent, a deer can wind a man at a half-mile.

But the wild turkey apparently never uses his nose—at least not for his own protection. While lying beside an old pine log in the wildwoods, I have had a whole flock of magnificent birds parade down the log past me, not one detecting my presence. But had I moved or made a sound, the case would have been entirely different. The wild turkey is all ears and eyes. I think his eyes are as keen as those of any bird; but he does not have the amazing range of vision of the birds of prey and the scavengers. A vulture can see

happened to know where they were due at a specified time. There is hardly a commuter who takes the 5:15 who will be more punctual than these kings and queens of the wilderness. Like most living things, they hanker after the place where they were born; and unless greatly disturbed, will commonly be found near the ancient hearthstone. I have known an unmolested flock to roost night after night in the same trees, and sometimes on the same limbs.

As they go to roost in the twilight, and come to ground at daybreak, not many naturalists have had the opportunity to study closely their roosting habits. It happens that a good part of my life has been spent in the wildwoods, in good turkey country, adjacent to the great river-swamps that are their (*Continuing on page* 532)

THE TRAGEDY OF BANDON

A Little Oregon Seacoast Town Suffers One of the Most Tragic Fire Disasters in Years

By STEWART H. HOLBROOK

Photographs by the Author

AT EIGHT o'clock on the evening of September 26, a brush fire entered the outskirts of Bandon, Oregon, and five seething hours later this little city of 1,800 population was a black and smoking memory. The known dead number eleven, a week after the disaster, and several persons are as yet unaccounted for. The damage to personal and real property is estimated at $3,000,000.

Bandon is as desolate today as was Hinckley, Minnesota, on that tragic day in September, 1894, or as was Cloquet, in the same state, in October, 1918, when the red fire demon struck. The Oregon town has thus been added to the list of classic and tragic victims of forest fire.

Yet the Bandon disaster, though having its origin far back in the forest, could hardly be called just a forest fire. It was rather the victim of a gorse fire; and gorse, or furze, is a handsome shrub, native to Ireland but not to the Oregon coast. I will go into the somewhat ironic history of this gorse a little further on.

To many minds, the greatest tragedy of forest fires is in the loss of valuable timber, of rich soil, of scenic masterpieces. Seldom are human lives, cozy homes, business, industry, even whole communities prominent in the picture of destruction by the Red Menace.

Yet, on September 26, the little seacoast town of Bandon, Oregon, with a population of less than two thousand, was caught without warning in a swirl of flame and smoke and destroyed. Eleven lives were lost, several are as yet unaccounted for. The damage to personal and real property exceeded $3,000,000.

Strange as it may seem, the loss in timber, in soil, in scenic masterpieces was practically negative. Starting in the slash burnings of loggers and farmers, the fire attracted little attention, particularly in Bandon. Around Bandon there are no forests. But suddenly something happened, something that no one expected, no one was prepared to meet. In exactly four and one half hours Bandon lay in ruins, with its entire population —except those who were caught by the flames—pushed into the sea. Mr. Holbrook was in the ruins of the little town before its ashes had cooled, and his story is dramatic and enlightening.— EDITOR.

The tragedy came on a Saturday. The sun that brought morning to Bandon on that day had a tinge of red in it. That meant smoke in the air, and Bandon folk knew that slash fires had been burning for several days back in the hills on nearby Bear Creek. But they thought nothing of it. There had been one goodly September rain. Loggers and farmers had been burning slash. The woods were full of hunters. Both activities were legal. It was a warm morning in the seacoast town, with the temperature climbing above 70 degrees long before noon. Of more importance was the fact that a hygrometer at a logging camp on Eden Ridge, not far from Bandon, showed a humidity reading of eight.

Twice during the morning Bandon's modern fire department had made runs to vacant lots, where grass and shrubbery had suddenly leaped into flame. These fires may have been caused by a tossed match or cigarette, or it is even possible they were started by an ember blown in from the east, where the slashings were burning.

By noon the fire department had been called a short way outside the city limits to protect the city water line, threatened by fire in the underbrush. But it wasn't much of a fire. Supper passed calmly, with nothing more than comment that the smoke was a bit thicker. Seven o'clock saw Bandon's movie addicts packed into a theatre to view a film captioned "Thirty-Six Hours to Live."

By now it was dark outside, And suddenly, on the southeast side of town, in the residential district, a spurt of flame shot up into the night. So sudden was this burst of fire, rising to a great height, roaring and crackling, that for a brief moment the folks in homes along Eleventh Street thought it an apparition, or possibly a meteor.

With sirens open the Bandon fire trucks roared through town to the spot. Here was a wide road, the place to stop the coming flames if they could be stopped anywhere. But the water seemed to have no effect on the blazing, snapping gorse, none of it more than six feet high.

In an instant the fire had leaped across broad Eleventh Street, shooting tongues of flame fifty feet and more into the air, spitting off oily gobs that turned into balls of fire. A line of hose was burned in two before firemen knew what had happened.

And now, back of them, to the west and north, small fires seemed springing up everywhere, as though some devil were hurrying through the dark with an unseen torch. Another line of hose was burned through. Roofs along Eleventh Street, and yes, on Tenth and Ninth. were smouldering—but not smouldering long, for presently they danced with fire.

The entire section, with its many fine homes, was doomed. From one of the homes an ambulance pulled away carrying a frightened woman who was to give birth to a child within an hour. That's how quick the fire came into the city.

Falling back, and sending out a call for all available men, members of the Bandon fire department made a last desperate stand to keep the fire from racing down a draw into the one-street business district.

Meanwhile, men of the Coos Forest Fire Patrol were fighting to save the city reservoir. And the United States Coast Guard was having difficulty evacuating many people who lived in the west side of town. It was a trying job. People, especially the old folks, seemed not to understand that their homes were doomed and that they themselves were in imminent danger. The Coast Guard men had to "talk tough" to many oldsters to get them to pick up a few personal belongings and leave.

The fire approaching the main highway near the doomed town of Bandon. At the left is a clump of gorse, the Irish shrub planted around Bandon by its founders—and which caused its destruction.

When the fire struck the gorse growing wild and in hedges around the little seacoast town, flames leaped fifty feet or more in the air, as though caused by an explosion, forming walls of intense fire.

Nor were all of them to make it while there was time. Mr. and Mrs. George Williams, Bandon pioneers, died on their little patch of ground, Mr. Williams at the door of their home, his wife in the woodshed. Nine more were presently to meet a like fate.

Sometime between eleven o'clock and midnight—and no man will ever know exactly when—the fire that had by now consumed nearly every home in the city swept up to the very rim of the bluff overlooking the business section. A little church went up in one burst of flame that was reflected in the proud plate glass windows of stores below the short hill.

And at the same time a roaring wall of flame threw itself into the heart of Bandon's business life. Here, the flames roared and boomed like cannon, and they reddened the blanched faces of hundreds of citizens who had fled from the residential district. Men were to tell afterward that they had never seen such an awesome sight before.

There was no stopping. there was not even delaying such a fire as this. Singed, blistered and burned, the Bandon firemen fell back.

The single street was crammed full of automobiles and of people on foot, folks bent with bundles and boxes, and of wide-eyed children lugging cats and small dogs.

On the edge of the town an automobile camp was spared from the flames and served later as a relief station for Bandon's homeless citizens.

There were three ways to go now. The road to Coquille was said to be open still, although one could see it was well lighted by the flames of barns and farmhouses, and lined by the spitting torches of gorse. Some of those trapped took that road. Another way out was to cross the river to the sand dunes. The lightship tender *Rose* was already ferrying women and children, and so were two small tugs. The third way was down to the jetty on the city side of the river.

Presently the sand dunes, across on the "cool" side, took on the look of a tragic picnic—swarming with moaning women and crying youngsters.

But others wanted to save their automobiles. They couldn't ferry these, so in a crush of jumbled traffic they edged their way down First Street, the only street, in the direction of the jetty. The fire was right at their backs, with firemen covering the retreat as best they could. The "fireproof" banks, the stores, the city hall, the theatre—they all roared inside like infernos, while flames shot out their gaping windows and crowned their roofs.

Down the single street moved the hundred or more cars, with fire blistering their backs and melting the very tires, until they could go no further. Here they piled onto a narrow strip of beach, some of them into the tide, but the last ones didn't get that far. You saw them next day, near the end of the pavement, and they were cruel caricatures of the latest streamlined models.

Down both sides of the street the buildings lighted up, one after the other, and when the hundreds of refugees got to the little beach, there was nothing ahead of them but the jetty and the Pacific Ocean.

Soon the jetty was swarming with people who found the piles of rock to be warm, but not hot, to the hand's touch. Red embers beat them with fire, and overhead, carried by the strange wind, went flaming pieces of boards, and even whole sections of roof. Onto the narrow beach piled other hundreds, the cars they had just abandoned already smoking. There was driftwood on this beach, some of it fair-sized logs, and the frantic, hurrying folk had no sooner reached the sand and shallow water than the driftwood began to blaze.

That's how hot it was at the end of First Street, and you can see the marks there today, three days afterward. Log upon log, once bleached white by the tides, now black from fire. Here was drama! Crouching behind these barriers of near-tinder, with their knees in the sand or shallow water, men and women could go no further. They had to stay here, or drown, and they must have prayed that Bandon would not take long in burning. Again and again the driftwood broke out in flame, and the soft hands of a score of women were cruelly torn by the gravel they scooped up and threw over the protecting and dangerously dry logs.

These crouching figures, with the very hairs on their heads being singed, could have seen, if they were watching, the very last gallant stand of their fire department at the end of First Street. Hose after hose was burned away, and finally the tires on the truck melted away in a black ooze.

Bandon had burned to the ground.

Over on the sand dunes, across the river, were the hundreds who had crossed in boats, while one woman remained aboard to give birth to a girl.

The eighteen miles of road to Coquille, county seat, were filled with other refugees, in cars and afoot, and they had no need of lanterns.

And up in the now cooling and blackening residence district lay the bodies of eleven Bandon folk.

Bandon had burned to the ground. It had burned, so far as the business district was concerned, within the brief space of an hour. The whole tragedy, from the time fire first flared up on the edge of town, until the last business block was gutted, occupied less than five hours. Five hours of seething hell.

Following the fire, as is usually the case, there were wild rumors of incendiarism; but until it is proved otherwise, most will hold to the theory of slash fires as the origin of the catastrophe. They may have been the slashings of loggers or of farmers, or of both; and they burned along sullenly for days, traveling on their belly, as they say, attracting little attention. And then, when all the factors were right—the humidity, the wind and the temperature, in the importance named—then, everything was logically set for exactly what happened.

A view along Bandon's main street after the tragedy. So intense was the fury of the fire that within the brief space of an hour the business district was wiped out.

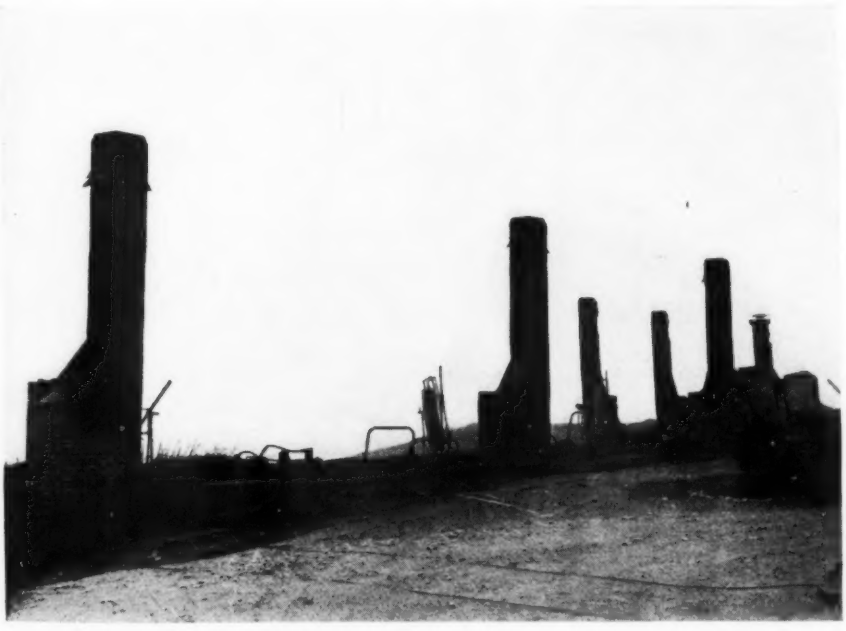
The slash fires merged, so to speak, somewhere along Bear Creek. Bear Creek is east of Bandon. An east wind blew stronger and then, as it grew, the fire made its own wind, for the wind was too slow of itself.

Around Bandon there is no forest. There are trees, here and there, small second-growth; and there are open farm lands. And scattered wildly all over this land is the gorse. When fire got into the goodly sized clumps of this shrub, which grew larger and thicker nearest town, that was when, as eye-witnesses said, fire seemed to explode out of the evening quiet. From that time on, it was little more than a race with death to the sand dunes and the jetty.

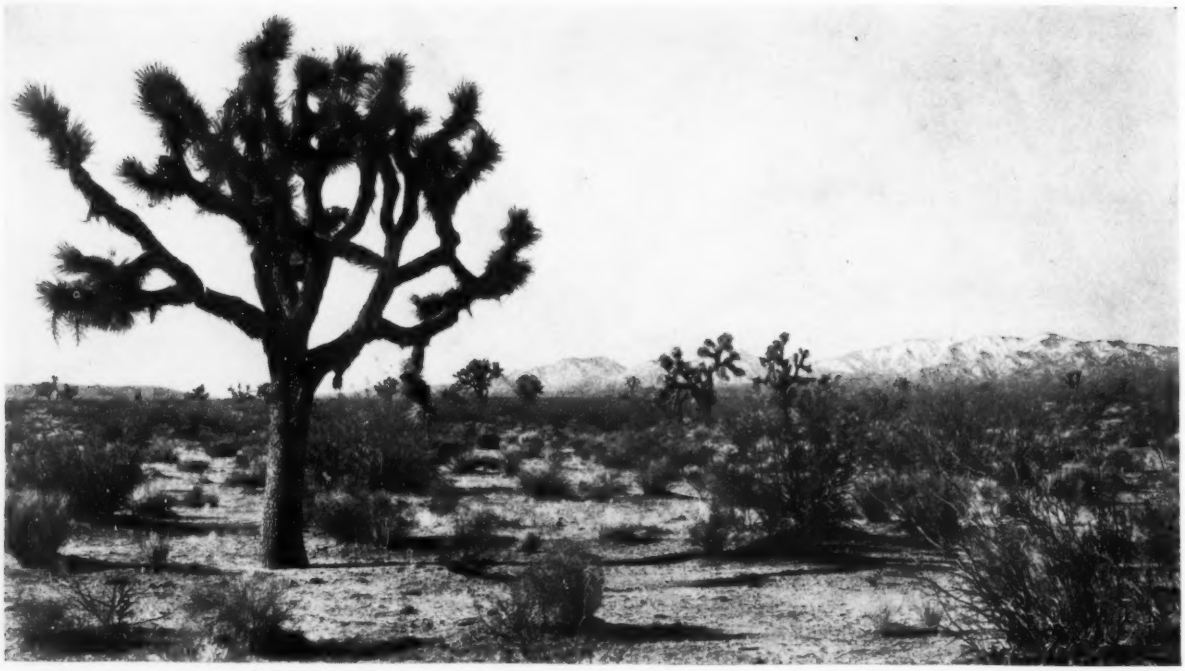
Now, about this gorse, or furze, also called "Irish Hedge." Back in 1873, George "Lord" Bennett, one of the founders of Bandon, which he named for his home in Bandon, Ireland, imported some of the shrubs from the old country. Planted on the Oregon coast, they soon lined the streets and filled the vacant lots of the town; and they "went wild" with a vengeance.

The plant is spiny and forms spiny cushions, six to eight feet above the ground. Within these cushions are dry and dead twigs. When they burn they produce a terrible fire, even in the wettest weather. The ferocity of the fire is undoubtedly enhanced by an oily substance in the leaves.

It is told by old-timers on the Oregon coast—and Bandon's fire department vows it also — that flames from the gorse will shoot up to a height of 100 or more feet. When warm days and a humidity low of eight came to Bandon, the "Irish Hedge" was ready to become walls of intense fire. As for the speed of their burning, the eleven bodies should be proof enough. With the gorse menace eliminated, a new and better Bandon will, phoenixlike, arise.



What remained of Bandon's residential district after the disaster. It was here the flames first struck with such violence that people were forced to run for their lives.



National Park Service

Looking into the new Joshua Tree National Monument, in the Colorado Desert of Southern California.

JOSHUA TREE FOREST

THE MOST RECENT OF THE NATIONAL MONUMENT FAMILY

By Robert O. Foote

UNLESS one accepts again the long obsolete use of the word "forest" to designate a waste place, the term "desert forest" may seem a misnomer. Yet there are desert forests, and one of them, on the Colorado Desert of Southern California, has just received official recognition, through the creation by Presidential Proclamation, of one of the country's largest National Monuments.

Desert forests may consist of many different sorts of trees. The nearest in conformation to the more familiar forests are those of juniper. Then there are the native fan-leaf palm forests of this same Colorado Desert. The cacti forest is not tall but it is more impenetrable than the densest of tropic jungles. There are smoke-tree forests, looking like a cloud on the horizon. And there are Joshua tree forests, such as astonish with their gaunt, angular limbs the tourist crossing the desert by train or motor for the first time.

This newest of National Monuments includes all these various desert forests within its huge area of nearly a million acres. But chiefly it is noted for its Joshua trees, and therefore has been designated the Joshua Tree National Monument. It is designed to become a place where all desert flora and fauna will have a refuge.

That such protection should be deemed necessary for a stretch of waste land roughly fifty miles across, will seem surprising to residents of other sections. But Southern Californians who have watched the desert slowly hacked away by settlements upon every spot susceptible to irrigation, who have seen the desert plants and flowers heedlessly destroyed by motor loads of Sunday trippers, and who know the healing power of the desert for the human spirit, rejoice that a little of it is to be kept intact.

First to recognize the need for such desert conservation and to arouse public sentiment was an elderly Pasadena woman, Mrs. Sherman Hoyt, known lovingly as "the friend of the desert." She is a person of wealth and assured position,—what *Time* would call very much a social registerite, whose active brain would not allow her to settle back to a life of indolent uselessness. It was Mrs. Hoyt who first began to acquaint other sections with the fascinating vegetation of the California deserts, through large exhibits which she sent to New York, Boston and London. She it was who by personal interviews so interested President Roosevelt in the particular section she sought to preserve in its native state, that he became enthusiastic for the project and pushed it through.

The Joshua Tree National Monument lies chiefly in Riverside County, and partly in San Bernardino County, California. It extends from the desert hamlet of Twenty-Nine Palms, south to Mecca, west to Garnet, then north into the Morongo Valley and eastward to Twenty-Nine Palms. This is an almost entirely unpopulated area of 825,340 acres, yet it is within one hundred miles of a population of 2,000,000 people.

In giving this large area National Monument status, little other serviceableness has been trampled upon. The mining prospects are insignificant, what little agricultural resources

exist are officially termed submarginal, there is no grazing and only slight cultivation of crops, no timber in the commercial sense, no power or irrigation possibilities beyond the fact that the Southern California aqueduct from the Colorado River crosses the Monument, no sport except a little shooting of game birds. A real waste, it would seem.

Yet not wasted. An ever increasing group of nature lovers knows that in the desert is the same beauty as in the evergreen forest, perhaps even a more entrancing beauty. John C. Van Dyke, the first poet in prose to call the deserts the breathing spaces of the world, wrote long ago:

"The sandy wastes, the arid lands, the porphyry mountain peaks may be thought profitless places for pilgrimages, but how often have you and I found beauty in neglected marshes, in wintry forests, in barren hillsides! The love of Nature is after all an acquired taste. One begins by admiring the Hudson River landscape and ends by loving the desolation of Sahara. . . . The desert has gone a-begging for a word of praise these many years."

While the new Joshua Tree National Monument is on the Colorado Desert, it really goes into the low mountains which give over into the Mojave. Both of these deserts, taken as a whole, constitute a series of lake basins separated by mountains. The Colorado, the smaller of the two, is a single one of these ancient basins, whereas the Mojave numbers several basins, such as Death Valley, Antelope Valley and Panamint Valley. While the geologic history of the Colorado Desert is rather obscure, government reports declare there is sedimentary evidence that in pre-Cambrian time and all through Paleozoic and Mesozoic times, the region alternately submerged and emerged. Volcanic activity started perhaps as early as the middle of the Mesozoic era and was followed in Tertiary times by deposition of sediments and extensive faulting and folding. During Quaternary time there has been great erosion of the surrounding mountains and deposition of the eroded materials in the lower levels. The Colorado Desert consists of the Salton Basin and surrounding territory, and the Joshua Tree National Monument is toward the northwestern corner of this basin.

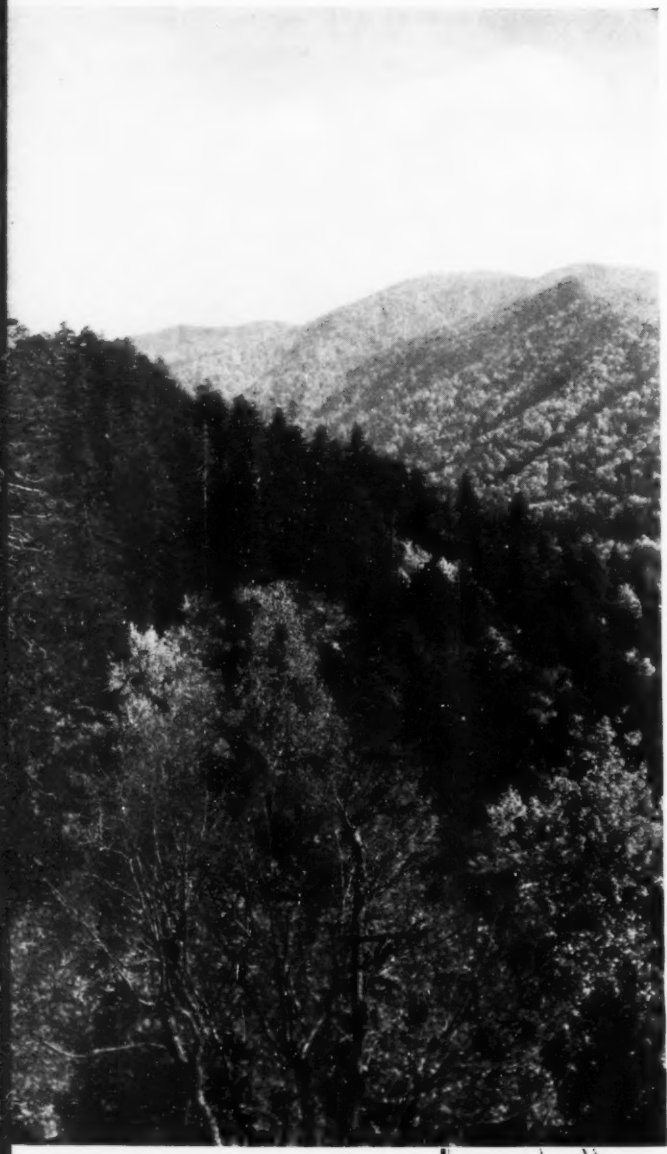
A California juniper, also a familiar figure in the landscape of the desert forest.

Embracing more than 800,000 acres of unpopulated desert country, yet within a hundred miles of a population of more than 2,000,000 people, the new Monument will serve as a great recreation area as well as a laboratory for desert flora and fauna. Above, at right, an outstanding example of the Joshua Tree, so named by the Mormons.

Various mountain ranges, not high, like the Cottonwood, Little San Bernardino, Eagle, Coxcomb, Palen, Little Maria and Maria Mountain, separate the region from the Mojave Desert, but as they are more or less parallel ranges with the axes north and south, they allow rather free migration, for plants as well as man, (*Continuing on page* 530)

FORESTRY AND FLOODS IN THE TENNESSEE VALLEY

By EDWARD C. M. RICHARDS

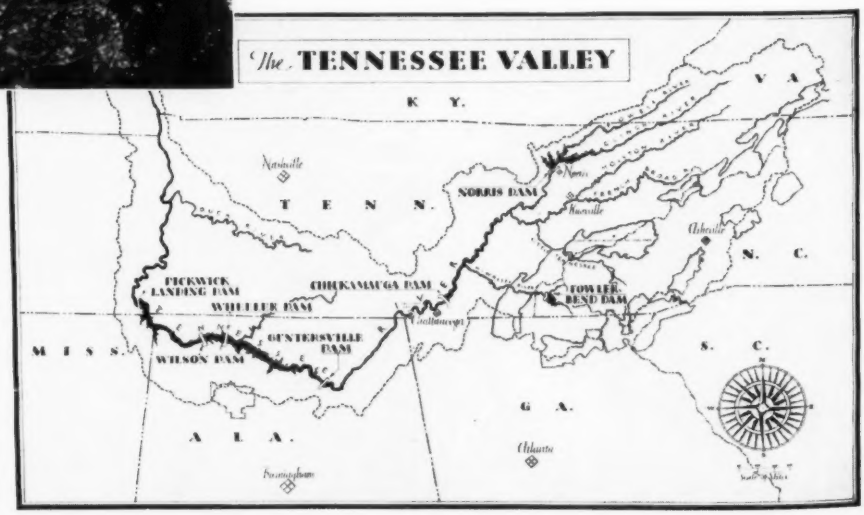


DUST storms in the Prairie States and floods in Pennsylvania, New England and other parts of the country have awakened the nation as never before to the need of controlling the run-off of water and to the necessity of soil erosion prevention. It is now generally known that we cannot continue to have a fertile and prosperous America if soil erosion and uncontrolled water wash the land from beneath our feet.

Of special interest in this connection is the fact that the progress of events has brought about a strong tendency towards closer cooperation in waterflow and erosion control work. Although in the past agricultural experts, soil specialists, engineers and foresters have all been interested in the prevention and control of both floods and erosion, nevertheless, for the most part, each group has gone its own way. Today those groups of technical experts are getting together, having recognized that control over the flow of water and the stopping of man-made erosion is a job which calls for united action.

As far as attacking the problem of control over the flow of water is concerned, it is now widely appreciated that if the country is to be saved from the destructive effects of the uncontrolled run-off of water, a clear-cut objective must be seen, appreciated and accepted. This objective might be stated as follows: Waterflow control must include a complete coordination and adequate protection of entire watersheds. Along with this should go the development and sustained use of all those natural resources found in a given watershed which affect the flow of water. This development and sustained use should be in the permanent interest of the people living on the land, as well as of the inhabitants of more remote regions.

Breaking down the above statement into its two principal points, the first, or protection aspect, brings out the



Half of the entire land surface of the Tennessee River basin is in forests, and a vast area of submarginal land must be put back to forests. Thus, in the waterflow control plan of the T.V.A. it is the foresters' task to build up and maintain a huge sponge-like reservoir of forest covered soil which will absorb and hold back as large a share as is possible of the precipitation falling on the Valley. The agriculturists and engineers take care of the water after it leaves the forest, and a great system of dams is being developed, as shown on the map at right. This system is unique in that dams cover the entire watershed and are operated as a single unit on the basis of a single plan.

The forester thinks of his job in waterflow control as that of being the culturist of a kind of gigantic sponge composed of the soil and vegetative cover taken together. He knows that dense forest cover with thick underbrush beneath, as shown above, absorbs and retards the run-off of rain. He also knows that young "brush" forests, shown at left, if protected from fire, quickly establish a spongy surface cover. He has found in his years of work that even individual trees tend to slow down the destructive effects of waterflow, as shown below.

necessity for approaching the waterflow control program by starting with the entire watershed of the stream to be controlled. At this point, it should be made clear what is meant by a watershed. To foresters and erosion, agricultural and other engineers, a watershed means all of the land surface draining into a single stream. Starting from the tip-top of the mountains will be found a little watershed drained by a single rivulet. Very quickly, however, the little rivulets unite to make brooks; the brooks unite to make creeks, and the creeks unite to make rivers. The watershed of a great river like the Tennessee, covering some 40,800 square miles of territory—approximately the same size as the State of Pennsylvania—includes the watersheds of such major tributaries as the French Broad, the Holston, the Clinch-Powell, the Little Tennessee, the Hiwassee, the Elk, the Buffalo, and other sizable streams. Standing at Paducah, Kentucky, where the Tennessee empties into the Ohio, one can appreciate the fact that every drop of water, except that which is evaporated or used by vegetation, falling on any part of the watershed of the Tennessee River, will flow past him into the Ohio at this point. The watershed of the Tennessee River in-

cludes the entire land surface sloping down to Paducah, Kentucky.

In the past, there has been a natural and human tendency on the part of foresters, agricultural experts, soil men, engineers, and others interested in control over the flow of water, to think only in terms of their own particular fields. Today, it is recognized that in attacking the problem, not only must entire watersheds be considered but also every phase of land use on such watersheds. It is the job of the forester to control the water on the forested areas and on the areas which are so steep that they cannot be used successfully for agriculture or other purposes than forestry. On the more gently sloping lands with soils suitable for farming, the agriculturist takes over the work of controlling the flow of water from the fields and terraces. In the streams themselves, the engineer takes charge of the flow of water by means of navigation channels, dams, reservoirs, dykes and levees. But the heart of the matter is that real waterflow calls for the united, coordinated teamwork of all these specialists.

A second point which is now more fully appreciated than ever before is the fact that not only must adequate control over the flow of water cover entire watersheds, but for completely successful control, all forms of land and water use within each given watershed must be recognized as bearing directly upon the problem. This means that, on a given watershed, control necessitates a detailed study of all kinds of land use. Forests, farmlands which are clear-cultivated, and lands which are used for grazing purposes are self-evidently important in this connection. Today, however, people are realizing that the conduct of mine operations, the establishment and operation of drainage and irrigation projects, the smelting of some kinds of ores, the maintenance and construction of highways, and even such apparently unrelated uses as game management, fisheries management, and the control over mosquitoes, all have their bearing upon the waterflow control problem.

To discover which forest trees and other plants could be quickly established on eroded gullied areas and submarginal land in the Tennessee Valley, the foresters established two nurseries. The one shown above is at Clinton.

It is particularly fortunate at this time that the Tennessee Valley Authority has been in existence long enough to have made a start on the problem of the control of the run-off of water on the watershed of a major river. Approaching the problem from all angles, it is the first time a united attack on the waterflow control problem has been attempted on such a scale and, therefore, it is of real interest to the people of the United States to learn what the Tennessee Valley Authority has been doing in this connection.

The engineering phases of waterflow control in the Tennessee Valley include, as the major item, the construction of a series of dams and reservoirs in the main river and in many of the larger tributaries. Wilson Dam is completed on the main river, while Wheeler, Pickwick, Guntersville and Chickamauga Dams are under construction. On the tributary streams, Norris Dam, on the Clinch-Powell Watershed has just been completed. The dam forms a lake which is of enormous value as a storage reservoir. The dam has been built so high that practically the entire flow of the Clinch-Powell Rivers can be held back for many months, thus reducing the floods in the Tennessee River lower down. When completed, the engineering set-up of control in the Tennessee Valley will mean that the water in the main streams and many of the large tributaries can be held back or allowed to flow according to the judgment of the engineers.

There is nothing new about the construction of dams. The new element in this picture is the construction of a complete system of dams covering the entire watershed—all controlled and operated from a single headquarters on the basis of a single plan. Quite naturally, the interest of engineers throughout the world is being increasingly focused on the effectiveness of this set-up in the Tennessee Valley.

The agricultural experts of the Tennessee Valley Authority are concerned with the control of the flow of water from the more gently sloping lands devoted to farm crop production of clear-cultivated crops like corn, tobacco, cotton and potatoes, and land used for small grains and for pasturage. The prevention of erosion and the control of the flow of water on these lands is through a program of increasing the use of terraces, introduction of strip cropping, and through a reallocation of land to crops which may be more capable of slowing down the flow of water than those heretofore used. Grass, the small grains, and lespedeza are important as agricultural crops for the more sloping farmlands and still are of great value in waterflow and erosion control because they tend to hold soil in place, render it porous, and thus retard surface run-off. Assisted by the fertilizer program of the Tennessee Valley Authority, erosion control and control over the flow of water on the agricultural lands is becoming more and more a regular part of farm management.

The foresters of the Tennessee Valley Authority, in their activities dealing with the prevention of soil erosion and the retardation of the run-off of water, concern themselves largely with the forested lands of the Valley, together with the lands which are not suitable for residential, industrial, or farm use. Such lands occur largely on the upper and

The development by the T.V.A. foresters of the best techniques for stopping erosion through reforestation is extremely interesting. First, in preparing eroded land for planting, they constructed small check dams built of stones and logs, shown at right. This proved too costly. Brush dams were then introduced. A simpler and more effective technique soon followed—brush matting wired down to pegs, as shown in the

center picture. Now the foresters mix straw with brush and forest litter for a cheap and effective means of slowing down the run-off of surface water, as shown at bottom of the page. The past two and a half years have enabled the T.V.A. foresters to make studies, investigations and demonstrations of a very practical nature, and today, the engineering phases of erosion control and the retardation of the surface run-off of water have reached a position far more effective and far cheaper than the rock check dam era. The technique now calls for a minimum of engineering structures, only enough being done to prepare the area for planting.

steeper slopes of the hills and on the tops of the mountains. Land now actually in forest in the Tennessee Valley totals well over 13,000,000 acres, or over half of the entire land surface of the Tennessee River Basin. Add to this vast area the submarginal farm areas, which should be taken out of cultivation and put back into forests, and the "erosion sore spots"—which are heavily-gullied areas completely destroyed for agricultural use by the removal of their top soil—the sum total of land area of the Valley which lies within the field of the activity of the forester, represents an empire in itself. It is the task of the Tennessee Valley Authority foresters, in the great game of waterflow control in the Valley, to see that the soil of this empire is rendered and maintained in as porous a condition as possible.

The forester thinks of his job in this work as that of being the culturist of a kind of gigantic sponge composed of the soil and vegetative cover taken together. While the agriculturists and engineers take care of the water as it comes down to the fertile lands and rivers below, the foresters' task is to build up and maintain, above on the upper slopes, a huge sponge-like reservoir of forest covered soil which will absorb and hold back as large a share as is possible of the precipitation falling on the Valley. The forest cover, in keeping the soil porous, allows for greater percolation and reduces the surface run-off.

In the minds of engineers, floods represent especially high rises in the flow of streams over and above what is normally to be expected at any particular time of the year. Such exceptional rises, of course, come after normal rises have taken place. Normal rises in the flow of streams ordinarily may be expected to occur, according to the line of reasoning on the part of engineers, when the soil and vegetative cover of watersheds have been thoroughly saturated with water. Large floods, in the engineer's use of the term, usually come after such saturation has taken place, and from that point of view, after the complete saturation of the soil and cover of the watershed. The effect of vegetation on any kind of floods, in such a definition of the term, is therefore practically *nil*, according to the engineers. The foresters of the Tennessee Valley Authority understand this point of view and take it into account in their work. They know it assumes theoretically that at the extreme maximum of precipitation, the work of the forester in establishing and maintaining vegetation on the watersheds will not prevent floods. However, such supreme limits of precipitation are comparatively rare over large areas while much is still to be determined by exact scientific research as to if and when watersheds become saturated. In the meantime, the activity of the forester in clothing the upper slopes of the watershed with a great water-absorbing and soil-loosening sponge of vegetation, goes far towards aiding the engineer and the agriculturist by reducing the amount of water rushing uncontrolled into the streams.

In the beginning, the foresters of the Tennessee Valley Authority recognized only too well their own lack of scientifically accurate information relative to the effect of forest vegetation on the run-off of water as applied to Valley conditions. Such information would have helped greatly in determining what should be done in soil erosion control and reforestation work. Long-time research studies were out of the question—immediate action was called for. The foresters, therefore, had to assume that in a general way any work which slowed down the run-off of water and tended to increase the porosity of the soil would help. Scientific studies in the Valley would have to come later, and in the meantime, much could be done and many lessons could be learned along practical lines.

Starting from scratch in the fall of 1933, a beginning was made through the use of Civilian Conservation Corps labor, first on the engineering phases of soil erosion control through the retardation of waterflow, followed by the establishment of a vegetative cover through the planting of trees and other plants. The rule-of-thumb approach of trial and error was adopted, per force, always bearing in mind the necessity of ultimately coming to the scientifically planned approach to many of the problems involved.

The actual development of the best techniques for stopping erosion through reforestation is most interesting and has proved to be extremely valuable. For example, in the beginning it was recognized that what was needed first was the retardation of the surface run-off of water on steep slopes and partly eroded areas, and the stabilizing of the soil so that trees could be planted. The use of the cheapest materials at hand indicated a technique of structures composed of rock, earth and logs. The first work in the C.C.C. camps in preparing eroding land for planting was, to a large extent, the construction of small check dams built of uncemented stones and logs. The foresters, however, were not satisfied that this technique solved the problem, and strove to reduce the costs and increase the efficiency of the work. It became apparent that stone check dams and even log check dams tended to use too many man-days of labor an acre. Very promptly the use of rock dams was discontinued, in large part, and even log dams were reduced in number. As a substitute brush dams were introduced in varying forms with considerable success. Then an even simpler technique was developed to slow down the run-off of surface water. This was the use of brush matting composed of the branches of trees thickly laid over the ground and wired down to pegs.

At first, cedar and pine brush composed of the limbs of nearby trees was used, care being taken not to kill the trees by over-trimming. Gradually, however, further studies indicated that the brush of hardwood trees could often be substituted, and finally the use of forest litter from the ground, or even straw, was found to be effective, more convenient, and correspondingly cheaper. In order to get an immediate vegetative cover, grass and legumes were sown under the mulch and brush.

The past two and a half years have enabled the foresters to make their studies, investigations and demonstrations very practical, and today, the engineering phases of erosion control and the retardation of the surface run-off of water by engineering means, has reached a position far more effective and far cheaper than the original plan of constructing only log and rock check dams. The technique now used calls for a minimum of engineering structures, only enough being done to prepare the area for the planting program.

Along with the work on the engineering phases of control over surface run-off the determination of the best methods of reforestation was also undertaken. The final control had to depend upon a vegetative cover, preferably one of trees. To discover which forest trees and other plants could be most cheaply and quickly established on eroded gullied areas and submarginal lands, called for experimentation with different species and methods of planting. Since no adequate supply of trees of suitable size and kind for this planting was available, two forest nurseries were established. In these nurseries, mass quantities of such trees as black locust, shortleaf pine and scrub pine were produced. A forest tree crop nursery growing black walnuts, Asiatic chestnuts, persimmons, paw-paws, and other forest trees and shrubs was developed. Trees from these nurseries were planted in various ways on different types of soils and on all exposures and slopes. The results of this work are not only an accumulation of much valuable information relative to just how to stop erosion and reforest poor lands, but also the establishment of numerous demonstrations right out in the field which will show, year by year, what happens to given types of areas under given (*Continuing on page* 530)

PARKS FOR THE MILLIONS

The Nation-Wide Program for More Recreational Areas Grows Under the C.C.C.

By CONRAD L. WIRTH

IN his dedication of Shenandoah National Park, in Virginia, newest unit in the National Park chain, President Franklin D. Roosevelt summarized with characteristic lucidity the principles and purposes on which the nation-wide movement for more recreational areas—national, state, county and metropolitan—is based.

"The creation of this park is one part of our great program of husbandry," the President said, "the joint husbandry of our human resources and our national resources. The product of the labor of the men of the Civilian Conservation Corps . . . it is as significant as though instead of working for the government they had worked in a mill or factory . . . Our country will need many other young men as they come to manhood for work like this—for other Shenandoahs.

"Is it a dream—will I perhaps be accused of an exaggerated passion for planning if I paint for you a picture? . . . In almost every other part of the country there is a similar need for recreational areas . . . roadside camps . . . smell of the woods . . . wind in the trees . . . for the benefit of men and women who every morning and every night can lift up their eyes to Mother Nature . . ." Fulfillment of this dream already is being realized in every state in this great union of states but one,—Delaware. And to the institution of the state and county park, offering speedy escape from city noises and crowds, have also been added, in twenty-four states, recreational demonstration projects, with organized camping and facilities for intensive recreational use. No other government has approached our own in the scope and variety of public

Wood for the park campfires—but more important, from a tree felled by C.C.C. crews in insect control work. This is only one of the vitally important jobs the C.C.C. is performing in park areas throughout the country.

recreational facilities developed during the past few years in National and State Parks.

It is becoming ancient history to point out that these benefits to the American people are direct and indirect results of the President's program for national recovery. Prior to the establishment of the Civilian Conservation Corps it would have been deemed Utopian to dream of acquiring large areas of land and to equip them as pleasure reservations for the enjoyment of the average citizen. At the beginning of 1933 there were but 792 State Parks and related areas, such as monuments and waysides, distributed among forty-two States. South Carolina, Mississippi, New Mexico and Oklahoma had no State Parks at all, and a number of states had done little to develop those they possessed.

Few states had been able to keep pace with the new trends in industry and human affairs, wherein shortened working schedules, machine production and the increasing use of the automobile combined to create at once more leisure and more tension than the race had ever known. Each week-end saw a wholesale exodus from every densely populated community. Those who did not motor into the countryside in their own cars depended upon commercialized transportation. Nearby resorts, the only refuges available for those who were limited in their expenditure both of money and of time, were crowded to capacity. States and municipalities admitted the lack of recreation grounds for their citizens and deplored the situation, but budget restrictions prevented any remedy. Adequate recreational development called for large crews of well-drilled men, directed by technical experts, both groups able to devote to the projects fixed periods of continuous labor. Thus conditioned, the prospect of providing open-air parks and pastimes in any ratio commensurate with the people's need of such facilities, seemed exceedingly remote.

Yet in only a scant three years the total area of state and local parks—exclusive of National Parks and Monuments—has swelled to 3,859,087 acres. In addition, 418,000 acres of submarginal land has been withdrawn from the economic liability classification and put to social use for recreational demonstration projects.

"Who cares whither a footpath leads? The charm is in the footpath itself," Thomas Wentworth Higginson once said. Could the New England historian return to earth today he would find the footpath so well established in the lives of the American people that it constitutes one of the main features of every park. If all the footpaths and bridle trails built by the C.C.C.—as its members are shown doing above, on Columbia Island, near the Nation's Capital—were joined together end to end, they would reach from the Atlantic to the Pacific.

The magic which effected this miracle was that "joint husbandy of our human resources and our national resources" to which President Roosevelt referred at the dedication of Virginia's National Park in the Blue Ridge Mountains. His far-visioned conception of the national emergency existing four years ago, and the equally comprehensive solution which resulted in the establishment of the Civilian Conservation Corps, took into consideration the human need of leisure time activities as well as the necessity for conserving nature and man-power.

Other government agencies have cooperated with the C.C.C. in this national agendum. Work relief camps and Federal emergency relief workers have assisted in the development of the new recreational program. But the C.C.C. enjoys the distinction of having carried on continuously in at least 452 State Parks—636 companies altogether—from the day the first shovel of earth was lifted in the early spring of 1933 up to the present time. These figures as previously mentioned, do not take into account projects undertaken in National Parks and Monuments.

When the National Resources Board came into being on June 30, 1934, the National Park Service, by executive Order, was assigned the task of assembling information on the recreational needs and facilities of the country. Based upon these findings a broad recreational program for the entire United States was formulated. Involved in this program was the duty of selecting such areas in the submarginal land acquisition program as were best adapted for recreational use; of obtaining options and other pertinent data; and of advising and coordinating the plans of state, county and metropolitan park officials in development of such areas. Recommended developments were to be done by C.C.C., F.E.R.A. and other relief workers, but to the National Park Service, with its record of twenty successful years of park development, was assigned the role of consultant and coordinator.

Today the concrete evidences of the success of this nation-wide recreation program may be seen by every visitor to a State Park or subordinate recreation area. Projects executed by the C.C.C. have provided diversions for the public ranging from such elementary facilities as wading pools for

little folks to restocking streams with fish or to the creation of artificial lakes for aquatic sports. Varieties of labor requisite for such construction have covered sixty major types of work with some 300 minor classifications. When, at the end of their enrollment periods, these thousands of young men, many of whom had never before had a chance to learn even the most rudimentary labor techniques, go forth from the camps, these skills and trades will be their levers in gaining employment.

Among the kinds of work entailed in developing recreational areas are the laying out and grading of the grounds; salvaging of usable timber for trail construction or firewood; transplanting of trees and shrubs, landscaping, sloping of banks and planting of vegetation to prevent erosion; erection of check dams, for the same purpose, with the accompanying labor of masonry; diversion ditches, impounding of waters, installation of water, sanitation and lighting systems; and help in the various items of carpentry incident to the erection of camp structures, shelters, fire lookout towers, picnic tables and benches.

Scenes of wilderness beauty such as this have been made accessible to thousands of Americans by the building of trails and minor roads in areas converted into state and county parks. Since 1933, the C.C.C.—636 companies altogether—has worked continuously in the development of at least 452 State Parks.

So much for the construction side of state recreational development. There has been also the prevention type of job—spotting trees and shrubs for the first sign of parasites and the control measures that follow; pre-suppression of forest fires, that most dreaded menace of the wilderness; destruction of insect-infested trees; removal of dangerous snags on highways or waterways where canoes or swimmers might suffer harm if they were not eliminated; measures calculated for the prevention and control of floods; mosquito-breeding pools sprayed in time to send whole colonies of immature mosquitoes to that special purgatory which it is devoutly hoped is reserved somewhere for their kind.

Projects executed by the C.C.C. in the State Parks have provided diversions for the public ranging from such elementary facilities as wading pools for youngsters to restocking streams with fish or to the creation of artificial lakes for aquatic sports. Above is an example of flood control work.

Of the forty-six recreational demonstration projects, not all are the work of C.C.C. enrollees. Many are being developed by work relief employees. But 2,809,939 acres of State Park areas represent the labors of the Civilian Conservation Corps. These State Park projects present as many kinds of outdoor recreation as there are personal preferences. They are so well keyed to modern needs that even the trailer is not forgotten. Camden Hills, in Maine, one of the recreational demonstration projects developed by the C.C.C., offers facilities for a score of tent and trailer groups. At Whitewater State Park, in Minnesota, the river of that name has been diverted to make a swimming pool, a form of diversion not readily attainable in that section. Cape Hatteras State Park, in North Carolina, involved a geological program, concerned with the encroachment of sand dunes upon the forest area. Big Bend State Park, in Texas, gave the enrollees an insight into the mysteries of

(*Continuing on page* 531)

The de la Ronde Oaks

THE HALL OF FAME FOR TREES

THE DE LA RONDE OAKS

NEARLY 150 years ago, twenty years before Louisiana became part of the United States, a French planter set out a double row of live oak trees on his plantation some four miles below the town of New Orleans. On his twenty-first birthday, Pierre Denis de la Ronde planted these live oaks to form a border for the road that led from his Versailles plantation house to the landing on the east bank of the Mississippi River. Incidentally, this same Monsieur de la Ronde married the widow of Chalmette. The famous oaks are now a shrine for tourists from all parts of the country.

Thirty-two years after they were planted, these oaks witnessed the fighting which took place in the Battle of New Orleans. The heaviest fighting occurred on parts of the Chalmette plantation, and the English had their headquarters just below the Versailles plantation. When he was mortally wounded, General Pakenham, nephew of the so-called Iron Duke of Wellington, was carried from the field of battle and, shortly after, died under a group of live oaks which, however, formed no part of the now famous row.

Through one of the queer quirks and twists often given to historical facts and happenings, the row of trees has erroneously been called the Pakenham Oaks when their correct name is the de la Ronde Oaks. Stanley C. Arthur in his account of the Battle of New Orleans, prepared for the centenary held in 1915, when the Chalmette Monument was dedicated, and in his "Old New Orleans Families," clearly states that this magnificent alley of oaks should be called the de la Ronde Oaks.

Through efforts of the New Orleans Historical Society, interest has recently been aroused in plans for the formation of a National Military Park at Chalmette similar to the National Parks at Vicksburg, at Gettysburg, and the scenes of other famous battles. This interest has again focused attention on the oaks. The land on which they stand is now the property of the Southern Railway. The dreams of de la Ronde of creating a second Paris with his plantation "Versailles" as its nucleus, came to naught, and only a few walls and piles of brick remain of the old plantation house, though the live oaks he so wisely planted are his living monument.

Numbering seventy-five, all told, these trees form probably the finest double row of live oaks in the South. The parallel rows are about one hundred feet apart and the trees stand approximately forty to forty-five feet apart in the rows for a total length of eighteen hundred feet. With a breast high diameter of from five to six feet, and with a crown spread of well over one hundred feet, these trees with their streamers of Spanish moss form a vista which once seen, will never be forgotten. The ravages of time, aided by fungi and decay, have taken their toll; several trees have had to be cut and two more are nearly dead. In order to preserve the remaining patriarchs, drastic measures are being taken. A tree surgeon has been at work trimming out dead branches, chiseling out decayed wood and filling the resultant cavities. So carefully and painstakingly is this work being done that new woody tissue has already grown over some of the earliest cement fillings. Over two-thirds of the trees have been cared for, and within a year or two, the

remaining ones will have been similarly treated. If the Federal Government takes over the thousand or so acres to form Chalmette Park, the preservation of these famous trees will be assured. It is hoped that the historical error may be corrected and that the name de la Ronde may be used in the future to designate this famous oak alley. The de la Ronde Oaks have been nominated for the Hall of Fame for Trees by Mr. Gus Lentz, of the Tennessee Valley Authority.

This striking view of the Beatty Catalpa in winter, shows its great arms weighted with snow and the posts of iron erected to supplement their strength.

THE BEATTY CATALPA

IN Princeton, New Jersey, at the corner of Vandeventer Avenue, stands a grand old tree known as the Beatty Catalpa. It takes its name from the historic Colonial mansion on the lawn of which it stands. This was once owned and occupied by Colonel Erkuries Beatty, an aide to Lafayette in the Revolution. Colonel Beatty died in 1823, but Lafayette—when he visited Princeton on his tour of America in 1825—visited the widow of Colonel Beatty and spent the nights of July 15 and 16 there. The house holds many historical mementoes of great interest. The central panel in the mantel in the west living room is an original carving, identical with one of the panels in the Italian mantel sent to General Washington for Mount Vernon by a wealthy Londoner named Samuel Vaughan.

The tree is eleven feet four inches in circumference at breast height, and its magnificent branches spread over seventy-five feet. In times gone by these great branches have held rows of Princeton freshmen, solemnly pretending they were rowing a boat, using tooth-picks for oars—when hazing prevailed at the University. The present owners have placed heavy iron posts to support several of the immense, nearly horizontal branches.

While the exact age of the Great Catalpa is not known, it is said by one of the Stockton family to be one left over from the famous row of thirteen planted by Richard Stockton's wife in front of their home in honor of the signing of the Declaration of Independence. These old trees stood mainly in the open, with little to protect them, and succumbed to the ice storm of several years ago, writes Mrs. Oliver Houghton Hubbard, of Princeton, who nominated the Beatty Catalpa for the Hall of Fame for Trees. The D. A. R. preserved one of the largest of the old stumps, marking it with a copper plate describing its history.

The Great Catalpa at the Colonel Beatty House in Princeton, New Jersey—just a gorgeous bouquet smothered in its own beautiful bloom.

A NORTH AMERICAN MARCO POLO

MONCACHT-APE, A YAZOO INDIAN, WENT TO THE PACIFIC BEFORE 1700 AND THERE FOUND BEARDED WHITE MEN GATHERING "A STINKING YELLOW WOOD" GOOD FOR MAKING DYES

By

DAREL McCONKEY

IF the little red history book that you and I studied had contained the story of the Indian traveler, Moncacht-apé, the mooted question of what was the "stinking yellow wood that dyes a beautiful yellow" that grew on the Pacific coast, and of the bearded white men who came to the mouth of the Columbia River to collect it probably before 1700, might by now have been solved. For then our generation would have known history as an incompleted story, and would have investigated.

But the orthodox historians who wrote that little red book and others of its kind had opinions of their own. They felt that boys and girls should not have their little heads bothered by unsettled historical problems. One of their prejudices inhered in their religion. A Catholic missionary's relation, according to an unwritten rule, though it set down freely and frankly a matter of antiquity, was not open for consideration. Nor did they care, always, to cross the barrier of another language.

At any rate, somewhere in the historians' shuffle, the *Histoire de la Louisiane,* of Lepage du Pratz, was left out of the reference picture until it became so old and rare that it can scarcely be found elsewhere today than in the rare book room of the Library of Congress.

Du Pratz was a Frenchman and planter in the old Colony of Louisiana between 1718 and 1734. He was a man of high intellectual curiosity. He explored the rivers that flow into the lower Mississippi and the islands about its mouth; he studied and listed the tribes of Indians dwelling there; he sought out resources of silver, lead, rock crystal, gypsum; and, he was interested in the origin of the Indians.

It was through this latter study that he found Moncacht-apé and first heard of the stinking yellow wood and the bearded white men. Living at the time among the Natchez Indians in what is now the State of Mississippi, he asked everyone he could about the place whence their fathers had come. They always pointed to the northwest, and averaging together the directions indicated by many a brown finger, he thought the Indians must have come from a latitude as high as 55 degrees. He had combed the Natchez tribe for information, and could learn no more. So he sought some wise old man in some of the neighboring tribes who might be able to give him greater light on the subject.

"I was so fortunate as to find such a one," wrote du Pratz, "at forty leagues from the Natchez in the tribe of the Yazoos. He was named Moncacht-apé." Du Pratz was tremendously impressed by this old Indian. "I cannot better compare him than with those first Greeks who traveled, principally in the Orient, to examine the manners and customs of the diverse nations, and who came back thereafter to communicate to their fellow-citizens the knowledge they had acquired. It is not only that Moncacht-apé executed such a beautiful project; he also conceived it, and he worked so hard that it became possible to him."

Du Pratz was delighted. He asked the old man to visit him for a few days and tell him the whole story of his travels, which were carried out with the intention of finding the land whence came his fathers. Once he had arrived there, he thought, he must learn a wisdom that through a space of time and distance had been lost. Having heard the story, du Pratz believed it. "The good sense that I recognized in this man, who had no interest whatever to impose upon me, made me add faith to all that he told me. I cannot persuade myself otherwise. . . ." And the observations of du Pratz, it is worth noticing, have borne well the scrutiny of nearly 200 years.

But what, you ask, was the stinking yellow wood?

Who were the bearded white men?

A stinking wood, to an Indian, did not necessarily mean a wood of fetid odor. And the French word *puant,* translated as "stinking" may mean any strong odor. So what was this scented wood, this aromatic wood, this stinking wood?

Since the days when Queen Hatshepsut of Egypt sent to the Land of Punt for incense trees in 1570 B. C., ships have coursed the world looking for perfumed wood. Sandalwood from the Indies and from the Sandwich Isles, sandarac from Morocco . . . the list could go on. But who was it that so far wandered from the warmth of tropic climes to come upon the rainy shoaly coast of Washington State to find a scented yellow dye-wood, and who came for it again and again?

Follow Moncacht-apé in his travels, and the answer may appear.

The Yazoo explorer journeyed from his home country up the Mississippi, up the Missouri, stopping with tribes on the way. From each he learned the language of the tribe that was ahead. He came to the Columbia, and traveled down its wide shining waters.

The last tribe on the river was a day's journey from the Big Water. Its people were hiding in the forest so the bearded men would not find them. These men, they said, came in a big pirogue out of the sunset-direction each year after the cold was gone. They cut and took away "a stinking yellow wood that dyes a beautiful yellow." They stole young people and made them slaves. A wise old man of their tribe had told them how to be rid of these strange men whose skin was white and who grew hair on their faces. Cut down all the yellow trees, he said, and they will not come again. They had done this thing, till the river bank was bare; they left only a few of the trees inland to make dyes for their people.

But other tribes were not so fortunate. Two of them, living beside the Big Water, had no wood but the yellow wood. They could not cut it all, so were forced to hide inland until the bearded men were gone. Finally they invited the surrounding tribes to come and help them kill the bearded men. Would Moncacht-apé come too? He thought about it. He had seen white men of different tribes. He had seen the fire-weapons that made a big noise and a big fire and he was not afraid of them. Besides, he was hungry to see these white men who grew hair on their faces and wore strange clothes. And it was on his way toward the country whence came his fathers. Yes, Moncacht-apé's heart found it good that he go with them.

They traveled for five days and came to a place where are two long high rocks that hold on to the big land. Here the tribes were gathered. Here, between these big rocks, the bearded men came with their big pirogues and went out from them on the shallow river in little pirogues to cut the yellow wood. They held council and mapped out their attack. They would divide into three parties. One would go inland to ambush the bearded men when they went out to cut wood. A second would hide in last year's cuttings and ambush them again as they ran. A third would be on the two big rocks and shoot arrows down on the bearded men as they scrambled on their big pirogue. A triple ambuscade. They waited, then, with Indian patience.

Seventeen days later the bearded men came. They took aboard fresh water in "wooden pots" like those "the French men use for fire-water." On the fourth day they went out to cut wood. "We made war against them," said Moncacht-apé. "But we only killed eleven." The others escaped to the big pirogues and fled away across the Big Water.

The Indians watched them until they could no more be seen. "Then we went to see the dead men who stayed there." Moncacht-apé examined them with the care of a scientist. They were truly white men with black beards that covered their chests. They had big heads and their bodies were big for their height. Their hair was not long except "toward the middle of their heads." They did not wear hats but cloth wrapped around their heads. Their clothes were neither of wool nor bark-fibres, but something like a Frenchman's old shirt, and very soft with many colors. The covering for feet and legs was of cloth, and of one piece. Moncacht-apé tried to put on a boot but his foot would not go inside.

Two of the eleven dead had fire-weapons. Moncacht-apé knew about guns, so he tried them out. They were heavier than French guns, and did not kill so far away. "So that," he told du Pratz, "is what I saw of the bearded men and that is how we drove them away. After that I thought of nothing else but traveling on."

Du Pratz assumed that the bearded men were Japanese. A like assumption has been followed in all subsequent discussions. But Dr. Ales Hrdlicka, curator of anthropology for the Smithsonian Institution, believes entirely otherwise. There is every indication, he declares, that they were a Mediterranean people, probably Spanish, possibly Portuguese. None of the Oriental peoples grow heavy beards; they did not at that time use guns. It was too early for recorded Russian visits to the Pacific coast, but Juan de Fuca, a Spaniard, had traveled there as early as 1542; a strait off the coast of British Columbia is named for him.

When first told of these bearded men, Moncacht-apé declared they could not be of the French, English, or Spanish tribes, who cut their beards and wore different clothes. When he saw them he apparently continued in this belief. But, says Dr. Hrdlicka, beard-cutting was presumably a practice only of the soldiery. Moncacht-apé had probably no acquaintance with the Spanish or Portuguese seaman, who let his beard grow, wrapped a scarf about his head, cut his hair around its edges similar to the way we barber ourselves today, letting it grow longer "toward the middle of the head," wore felt boots, and carried the heavy blunderbuss of the period. He was short and heavy-set compared to the Indian, and his head was large as measured by the same standard.

These bearded men came in a big pirogue out of the sunset-direction each year after the cold was gone to cut and take away the "stinking yellow wood."

Nor should it be supposed that every venture into far lands has been written down. If these trader-adventurers found on the west coast a supply (*Continuing on page* 532)

Wildlife *Has* a Sense of Direction

Birds Prove It in Their Annual Migrations Over Thousands of Miles of Land and Water

By E. A. McILHENNY

IN the May issue of AMERICAN FORESTS, Calvin Rutstrum, in an article entitled "Has Wildlife a Sense of Direction?" attempts to show that wildlife moves from place to place "by use of one or more of the simple senses—visual, olfactory, auditory, tactile, muscular, or kinesthetic" and cites as his governing factors the flight of homing pigeons and experiments made with cats and bees. His conclusions are drawn from a bird, a mammal and an insect that have been domesticated by human beings for thousands of years, and have, in this time, lost to a great extent, by civilization, the use of faculties they were originally endowed with.

He cites instances of these domesticated creatures failing to return to their homes when taken from their immediate vicinity to localities with which they were not familiar. He does not cite in comparison the many, many instances of migration and homing which all of our migratory birds exhibit twice each year. Mr. Rutstrum acknowledges that the sense organs of humans are "blunted by artificial living." This fact is equally true of the domestic bird, mammal and insect, whose sense of direction he questions.

In his article, Mr. Rutstrum states: "Scientists are quite well in agreement on one thing—that the going has much to do with the coming. This implies, of course, that actual cues are gained in the going which govern the return."

Is it possible that birds leaving the northern coast of North America and not sighting land again until they reach South America, and birds leaving Alaska and not again sighting land until they reach the Hawaiian Islands have their direction governed by cues gained in flying over the oceans? And, how about the Arctic tern? This great traveler leaves Arctic America, its nesting ground, and flies across the ocean to Africa and the Antarctic continent where it spends the winter, returning each spring to its nesting ground in northern North America. Do these birds depend on "cues of familiar territory" for making their return? A little further along I will show quite conclusively that Mr. Rutstrum's statement: "The going determines, to a great extent, the coming," is erroneous, for in many instances where the migration routes of species of birds are well-known, the southern migration route is a great distance from the return or northern migration route.

What impulse or power does the Arctic tern possess unerringly to fly thousands of miles across water in its migrations, unless it be a sense of direction?

Mr. Rutstrum further states: "As a rule, birds do not migrate in a straight line, but rather from bush to bush and from stopping place to stopping place. Is it not safe, then, to assume that they know their geography?" If birds migrated from bush to bush, they would undoubtedly have an opportunity of knowing their geography.

His second statement—"from stopping place to stopping place"—covers considerable territory, for he places no limit on distances. What landmarks are there between Alaska and the Hawaiian Islands—a distance of about 2,500 miles—that would enable birds making this flight to "know their geography"? It is difficult to prove that which we do not understand, and because human faculties are so limited, we may never prove or understand the reason why birds can find their way over thousands of miles of trackless ocean to a small island, or, from the Arctic to the Antarctic. But that they have a sense of direction, there can be no doubt.

Man may make longer journeys, but his journeys are made in mechanical contrivances and not by his own power, and until the compass, the sextant and the quadrant were invented, and a method for their use in determining direction proved, man was at a loss to travel the seas. With these instruments and a chart, one who understands navigation can go to any part of the earth. Birds make use of none of these mechanical inventions. Their power to travel thousands of miles over sea, far out of sight of land, lies within themselves. They have in their make-up a sense of direction which man may have had in his primitive state, but which is no longer his.

If a man is on the water without a compass, and a heavy fog shuts out all landmarks and obscures the sky, it is quite impossible for him to determine in which direction he is headed. Of course, if there is a wind or current, and he knows their direction, he can draw reasonable conclusions as to the proper direction to head, but without some outside influence, he is lost.

Birds are never lost. In the densest of fogs, birds continue their flight with unerring accuracy. Sea birds go from their nesting grounds, far over the water in search of food, and never fail to take the shortest route in returning—no matter what the weather.

I cite the migration of the cliff swallow. This little bird nests over most of the northern regions of the United States

Courtesy United States Biological Survey

Birds that nest in the North and spend their winters in the South, as do our species of wild ducks, are undoubtedly urged by their instinct of reproduction to start on their northern migrations and by their homing instinct to return South. A sense of direction makes it possible for them successfully to complete both migrations, for without it they could never carry through.

—all the way up to the Arctic for that matter—and winters in South America. In their southern migration, the cliff swallows nesting in eastern North America go west, and those nesting in western North America go east. They then head south through Mexico and Central America, in a rather narrow track down to central South America. In returning, they follow the same route to Central America, then cross the Gulf of Mexico to the Mississippi Valley and follow it up to the central part of the United States. Their course until they reach the central states is rather narrow, but there they spread out fan-like over most of the northern part of North America. I wonder what "cues" they follow in crossing the 500 miles of the Gulf of Mexico?

The mourning warbler nests from Nova Scotia to Manitoba—a distance from east to west of more than 2,000 miles. In going to their winter home, the eastern birds go west and south, and the western birds go south and west, gradually concentrating their route as they reach Texas. Continuing south their route becomes much more constricted as they pass through Mexico following the Gulf Coast, and is constricted to less than 100 miles as they pass through Panama to South America, where they spread out in a very restricted territory. Their northern or breeding range is more than 2,000 miles in width. Their southern or winter range is approximately 200 miles wide. Is it to be supposed that these small birds can remember the terrain over which they are to pass in their migration of about 5,000 miles north and south?

Now, follow the migration of the European wheatear. This small bird, which is not much larger than an English sparrow, winters in northern Africa and nests in western Greenland and Elsmere Land. In its migration to and from its summer and winter homes, it travels over thousands of miles of water and hundreds of miles of land. Is it possible that it knows the terrain over which it flies and is guided by "cues"?

The blackpoll warbler is another interesting illustration of a bird nesting over a very wide territory in North America and migrating over a narrow route to South America. This bird nests from the Arctic Ocean in Alaska to New Foundland—a territory of about 4,000 miles in width. On its migration it concentrates gradually as it moves south to a lane of less than 100 miles in width as it passes down the Florida Peninsula, thence across the Gulf and Caribbean Sea to Venezuela, a water jump of more than 1,000 miles. What "cues" can it possibly have while passing over the great expanse of water?

And, how about the phalaropes, which raise their young on the Arctic Coast of North America and winter far out at sea off the American and Cuban coasts? Do they find their way over the trackless sea by means of "cues"?

Birds not only have within them a power of direction, but they know, to a very marked degree, the time or season for their movements north and south.

How can the bobolink, nesting over most of the northern states and Canada east of the Rocky Mountains, unless it possesses a sense of direction, find its way on its southern migration through the southeastern states, down the peninsula of Florida, across the Gulf of Mexico and Caribbean Sea to South America, and its winter home on the plains of Brazil? In returning, it is true, it takes the same course north, covering on its round trip a distance of approximately 17,000 miles. Is it possible that it can remember "cues" while covering this 8,500 miles of journey that it makes twice a year, much of it out of sight of land?

The numerous birds of North America that travel to the Hakaiian Islands must have remarkable eyesight or marvelous memory to be able to make the 2,000-mile journey from Alaska to these Islands. Yet, a considerable number of North American birds are regular or casual visitors to the Hawaiian Islands in winter. The mallard, baldpate, pintail, green-winged teal, shoveler, bufflehead and red-breasted merganser are among the ducks visiting these islands in the winter; while the ruddy turnstone, bristle-thighed curlew, wandering tattler, pectoral sandpiper, western golden plover and sanderling are among the shore birds that use these islands as a winter resort.

This journey to the Hawaiian Islands is for a winter home, and is not brought about by the urge of reproduction, which causes the spring migration. The homing instinct in birds must be as strong for their winter homes as for the summer home. This great sea journey must be made without a stop by many of the birds undertaking it, for should some of them light on the water, not being able to swim, they would perish. Should these migrants travel at a steady rate of forty miles an hour, it would require those that leave Alaska and go to Hawaii more than fifty hours to make the sea journey.

Now, follow the Arctic tern—what "cues" does it remember during its spring and fall migration? This bird nests as far north as there is land in the Arctic, and as far south as Maine on the Atlantic Coast. On its southern migration, it is not found along the coast south of its nesting grounds. When leaving its breeding grounds it goes to sea and comes to land again along the shores of the Antarctic continent. This bird has no compass, sextant, quadrant or chart, but it finds its way over the thousands of miles of sea with unerring accuracy. What "cues" can it possibly have to guide it on its round trip of more than 25,000 miles? The impulse or power which causes it to make the journey and to carry it through successfully is within itself. Neither fog, storm, nor night causes it to lose its way.

One of the author's waterfowl traps on Avery Island, in Louisiana, where he has been studying the migration of birds for a good many years.

Probably the most remarkable migration we know of is that of the eastern golden plover. Its breeding range covers the width of Arctic North America from Bering Straits on the west, to Baffin Island on the east—an east and west distance of more than 2,500 miles.

As soon as the young plovers are strong enough to take care of themselves, but before they are capable of protracted flight, they are deserted by their parents. The old birds move east and south to Labrador and Nova Scotia, and from there head south across the Atlantic for northern South America. Some days after the adult plovers have made their journey across the ocean, their oldest children arrive in Labrador and Nova Scotia, where they rest for a short period. Then they follow their parents south, a 2,500-mile journey across the ocean, more than 2,000 miles of which is many hundreds of miles from land.

Here is a totally unexplainable fact in the migration of this bird. The late hatched young, not strong enough to accompany their older companions when they left their Arctic home to go to Nova Scotia and Labrador, and from there to South America, make their southern migration following a narrow territory from the Arctic down the Mississippi Valley, across the Gulf of Mexico and Caribbean Sea to the northern shore of South America, far west of the point reached by their parents. Both groups of these birds on reaching South America are not content to rest north of the equator, but continue their journey to the pampas of Argentine, in the extreme southern part of South America. These tiny birds, weighing less than six ounces, have, in order to reach their winter home, covered the amazing distance of more than 10,000 miles. Now, let us see what these birds do on their return journey, and how much their northern migration route is effected by the "cues" obtained on their southern journey.

On leaving the pampas of Argentine they take an entirely different route to their northern nesting grounds than that followed when they went south. When the return journey is begun, they fly northwest from Argentine to Yucatan, thence across the Gulf of Mexico to the coast of Texas, then north, following a narrow strip across Oklahoma and Kansas, and on to Arctic North America. On reaching this destination they again spread from Bering Straits to Baffin Island.

A marvelous memory for "cues" they must have on this vast journey, much of which is over the sea many hundred miles from shore. As this return northern journey averages more than 300 miles west of the journey south, how can Mr. Rutstrum reconcile his statement—"This implies, of course, that actual cues are gained in the going which govern the return"? If this statement is correct, a marvelous sight these birds must have—sufficient, at least, to overcome the curvature of the earth.

Unless they possess to a remarkable degree a sense of direction, how is it possible for the albatross and shearwaters to roam the thousands of miles of ocean they cover, and return at the proper time to their nesting islands? The short-tailed albatross nests on Wake Island, a tiny islet in Mid-Pacific Ocean about halfway between Hawaii and the Philippines. The Laysan albatross nests on Midway Island in the middle Pacific Ocean. The playground of these birds in winter is the entire Pacific Ocean.

The regular range of the slender-billed shearwater includes the coast of North (*Continuing on page* 528)

EDITORIAL

On To Victory

THE Federal Government, fighting to save the country's elm trees from the ravages of the Dutch elm disease, has reported a preliminary victory. An army of 5,000 men, mostly relief workers from the ranks of the W.P.A., its strength augmented by the latest weapons of science, including autogyros and tree poison, has, it is asserted, checked the spread of this insidious tree killer.

America may well rejoice in this report, but there must be no relaxing of vigilance. The enemy, although checked, still threatens. To relax the fight now is to invite defeat. The war must go on until the last diseased tree is felled and burned. The captains have drawn their plan of battle. Ultimate victory lies in the man-power and weapons the nation places at their disposal.

Unfortunately, an adequate fighting force to complete the work of extermination is by no means assured. By its failure to recognize the true value or worth of the elm tree in American life, Congress has repeatedly endangered the fight for its preservation by throwing the financial burden of the campaign upon emergency relief agencies, such as the W.P.A. While these emergency funds have been generous, they are of uncertain tenure and frequently difficult to administer. This is illustrated by the fact that on a number of occasions in the past the fighting force has been withdrawn at critical seasons because funds were lacking and the dread disease permitted to gain a stronger foothold. More to the point, there is no assurance at the present moment that there will be sufficient funds from relief agencies—or any other source—to continue the fight after January 1.

Inasmuch as Congress, in light of its past attitude toward appropriating funds for the eradication of the Dutch elm disease, has apparently placed a relatively insignificant value on America's elms, it might be well to consider this cherished tree in terms of dollars and cents. According to a formula often used by commercial tree men, the elm, as a shade tree, is valued at $10 an inch of diameter, or an average value of at least $50 a tree. On this basis, the monetary value of the elm shade trees within sixty miles of the Statue of Liberty, in New York harbor, exceeds $250,000,000. To this may be added the value of the trees for lumber, firewood and for the protection of watersheds.

Beyond the limits of this infected zone—in Pennsylvania, New York, throughout the length and breadth of New England and well into the Central States—are millions of elm shade trees. To place an accurate value on them, using the formula of commercial tree men, would be impossible because their number has never been closely estimated. Enough to say, however, that the figure would probably exceed $2,000,000,000.

Up to the present time, $7,000,000 of Federal money has been expended to hold the disease in check in the great metropolitan area around New York. Government officials in charge of eradication activities will not definitely commit themselves but estimate it will require four years more to drive the invader from our shores. To accomplish this, appropriations of at least $3,000,000 a year for the next four years will be needed. This means that for an expenditure of approximately $20,000,000 the country may save a natural asset, the value of which in the present infected area alone, approximates $250,000,000. If the disease is not checked in the present infected area and is allowed to spread through the entire range of the elm tree, the loss to the nation may well exceed $2,000,000,000.

In the light of past doubt in respect to the possibility of saving the American elm, the situation today is encouraging. It indicates first that the disease is being brought under control, and second that at a cost of only about one per cent of the value of the species the disease can be exterminated. Success or failure will depend upon vigorous completion of the work of extermination and this calls for the appropriation of the funds needed after January 1. The National Conference on Dutch Elm Disease met recently in Washington and urged the Bureau of the Budget to recommend a congressional appropriation of $3,000,000 for next year. This sum is based on actual expenditures for each of the past two years.

The action Congress must take is clear. It must appropriate the $3,000,000 needed yearly for the next few years. The appropriation requested for the coming year would bring the total amount of public money spent by July 1, 1938, to $10,000,000. Another $10,000,000 spent over the following three or four years may be necessary before the disease is safely eradicated. But that is a relatively small expenditure compared to the value of the American elm and to subsequent costs of fighting the disease if expenditures now are relaxed and the disease is allowed to spread throughout the country. Let the battle cry of all who love and appreciate the American elm be "On To Victory."

Field and Forest for Boys and Girls

STATE TREES

By Aletha M. Bonner

Blue Spruce—State Tree of Utah.

THE majority of states in the Union have official flowers and birds, but not every state has an official tree: that is, one selected by popular vote of the people, or by legislative adoption. However, Rhode Island, Illinois, Texas, Indiana, Pennsylvania, Utah, Georgia, Louisiana, Idaho and South Carolina each enjoys the distinction of having a "State Tree" listed in its legislative files.

Rhode Island, the "little state that does big things," was the first state in the country to agitate the question; and in 1894 the boys and girls of the public schools of "Little Rhody" conducted a Name-Your-Favorite-Tree Campaign.

The outcome of such a vote was the maple, a tree prized for its beautiful shade, and having high commercial value. Some of the most interesting varieties are sugar maple, the silver, red, black, ash-leaved and sycamore maple.

The next state to name a favorite tree was Illinois, when by Act of its Legislature—approved in 1908—the native oak became the official citizen. By popular acceptance this is the Bur oak, described in detail on page 518 of this issue of American Forests.

Like the maple, the oak boasts an extensive "family tree," the representative members being white oak, red oak, black oak and the live oak. Any furniture man will give this stalwart giant a high rating, while in point of historic interest it rivals only the elm.

Texas gave official recognition to the pecan in 1919, and some eight years later, or, to be exact, March 25, 1927, the "Lone Star" Legislature passed a law reading: "It shall be the duty of the State Board of Control, and the State Park Board to give due consideration to the pecan tree, when planning beautification of state parks, or other public property belonging to the State."

Indiana's Legislature, in 1931, selected the tulip tree as the state favorite. It is known also as yellow poplar.

Louisiana chose the flowering magnolia and Idaho the white pine.

The State of Pennsylvania, by Legislative Act, approved in 1931, voiced preference for the hemlock, as being the tree which "yielded to our pioneers the wood from which they wrought their cabin homes." It has been called a "tree of high and low degree," for while it may tower some two hundred feet, yet its plumy lower branches gracefully sweep the ground. The Keystone State looks kindly upon the mountain laurel as well, and by Act of its General Assembly, on May 5, 1933, adopted the fragrant laurel blossom as its official flower.

In 1933 the blue spruce of the Rocky Mountains was given legal status as the State Tree of Utah, and in 1935 the Georgia State Legislature named the pine. Georgia has four pines of commercial importance, but the longleaf pine

Georgia's State Tree—the Longleaf Pine.

is the largest and of greatest significance. South Carolina chose the palmetto.

While other states have failed or neglected to designate their favorite trees officially, many of them have "unofficial" State Trees—trees accepted by popular opinion without the formality of legislative or other official action.

In Arkansas, for instance, the oak is the unofficial State Tree. Yet Arkansas officially honors the apple tree, or at least its blossom, the State Legislature, in 1901, naming the apple blossom the state flower. California quite naturally, claims the Sequoia, but unofficially; Colorado the blue spruce; Florida the palm. Florida also recognizes the orange tree, its blossom, by legislative approval, having been named state flower in 1909.

Kansas unofficially claims the cottonwood; Kentucky the tulip tree, or yellow poplar; Louisiana named the blossom of the magnolia tree as its official state flower; Maine the pine; Michigan the apple tree. The State Legislature of Michigan officially recognizes the blossom of the apple tree as its floral emblem.

The white pine is the unofficial State Tree of Minnesota; Mississippi likes the magnolia, and the school children of that State voted to make the magnolia blossom the state flower. Missouri took legislative action in favor of the hawthorne blossom as its state flower. New York unofficially recognizes the maple; North Carolina the tulip tree, or yellow poplar; North Dakota the green ash; Ohio the buckeye; and Oklahoma the pecan. Oklahoma, in 1893, through its territorial legislature, adopted the mistletoe as its state flower.

Vermont claims the maple as its symbol, though unofficially; Wisconsin the maple, also. Virginia officially recognizes the dogwood, but only its flower, this being named the official flower of the State in 1918.

Beautiful specimen of Hard Maple. The maple is the official State Tree of Rhode Island—the unofficial choice of New York, Vermont and Wisconsin.

Tree effigies are to be found on many of the "Official Seals" of the states. Florida features the cocoa tree; Maine and Vermont seals carry the pine's portrait; and South Carolina, the palmetto.

Nebraska, Nevada and Oregon delineate trees growing along the mountain-sides; North Dakota pictures a tree on a plain; Indiana's seal reveals two shrubs standing and one having been cut down; while on the reverse side of Georgia's seal a tree is shown giving shade to a flock of sheep. The leaf of the Silver maple is widely recognized as the symbol of our northern neighbor, Canada,—while the rounded lobed English oak is the national tree of England. Efforts have been made to name the Bigtree of California as this country's official tree, and a bill to this end was introduced in the last session of Congress. It was not acted upon, largely because of the limited distribution of this tree.

Making the inhabitants of treeland official members of our great state family is a noteworthy movement, and it is to be hoped that all of the states will in time thus honor "Nature's nobles and most distinguished citizens—the trees."

TREES AND THEIR USES

No. 19 - - - BUR OAK

THE FRUIT IS UNIQUE. THE BROAD, SMOOTH NUT, SOMETIMES 2 INCHES LONG, IS NEARLY ENCLOSED BY A ROUGH MOSSY CUP FROM WHICH THE TREE DERIVES ITS NAMES.
THE WOOD OF BUR OAK IS HEAVY, STRONG AND CLOSE-GRAINED, RESEMBLING THAT OF WHITE OAK. IT IS USED FOR SHIP BUILDING, INTERIOR FINISH OF HOUSES, CABINET-MAKING, AGRICULTURAL IMPLEMENTS, RAILWAY TIES AND FENCING. THE FACT THAT THE WOOD IS ESPECIALLY DURABLE WHEN IN CONTACT WITH THE GROUND MAKES IT VALUABLE FOR THE LATTER.
IT IS AN INTERESTING TREE FOR ORNAMENTAL PLANTING AND IS EASILY PROPAGATED FROM ACORNS PLANTED WHERE THE TREES ARE TO DEVELOP.
ILLINOIS, BY AN ACT OF THE STATE LEGISLATURE APPROVED FEBRUARY 21, 1908 DESIGNATED THE NATIVE OAK AS ITS STATE TREE. THIS IS GENERALLY INTERPRETED TO MEAN THE BUR OAK.
THE BUR OAK, SOMETIMES KNOWN AS MOSSY CUP OAK, GROWS TO AN AVERAGE HEIGHT OF EIGHTY FEET, BUT IN THE VALLEY OF THE LOWER OHIO IT HAS BEEN KNOWN TO REACH 170 FEET. IT IS FOUND FROM MANITOBA TO NOVA SCOTIA, SOUTHWARD THROUGH PENNSYLVANIA AND WESTWARD INTO KANSAS AND TEXAS.
THE LEAF IS THE LARGEST OF ALL OAK LEAVES, BEING 6 TO 12 INCHES LONG AND HALF AS BROAD, WITH FIVE TO SEVEN ROUNDED LOBES. ON EACH SIDE NEAR THE MIDDLE OF THE LEAF A DEEP ROUNDED BAY REACHING ALMOST TO THE MIDRIB, PRACTICALLY DIVIDES THE LEAF INTO TWO DISTINCT PARTS.
FROBE

BUR OAK

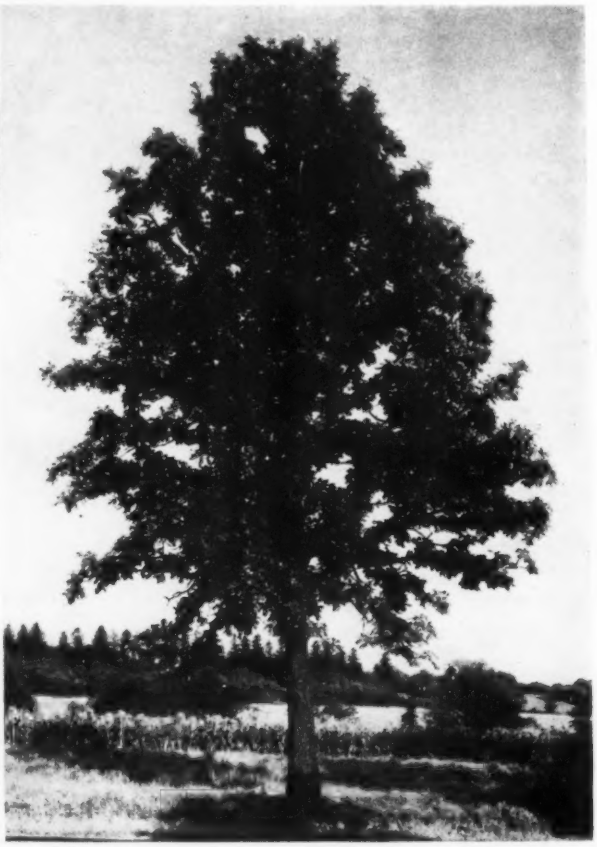
Quercus macrocarpa, Michaux

Photographs by George J. Baetzhold, Jr.

BUR OAK is one of the largest, and next to the white oak, the most majestic of American oaks. It is characteristic of the Middle West but grows with surprising adaptability over much of the eastern half of the United States from the Turtle Mountains and Black Hills of the Dakotas, south to the Nueces River, of central Texas, east through Tennessee and West Virginia into Maryland and Delaware to the Atlantic, and north into southern Manitoba, Nova Scotia, and New Brunswick. It attains greatest size and highest commercial importance in the Wabash River Basin, of Indiana and Illinois. Typical of the "oak openings" of the Lake States, it is the most common oak of Kansas and the Prairie States.

Open grown trees develop an irregular broadly rounded crown with stiff, gnarled branches and stout, frequently crooked, corky-winged branchlets. Ordinarily seldom over eighty feet high or three feet in diameter, trees 170 to 180 feet high and six or seven feet in diameter have been reported. Under forest conditions it develops a tall, massive, clear trunk which supports a moderately broad, open crown of stout branches. In contrast to these splendid dimensions it may, on unfavorable sites live for years in thickets without attaining heights of more than six to eight feet. Under such conditions it is frequently referred to as "scrub oak."

The rounded lobed leaves, wedge shaped at the base, are the largest of all the oak leaves, being six to twelve inches long and three to six inches broad at the upper half. Two unusually deep wide bays or sinuses dip in near the middle of the leaf toward the stout pale mid-rib which is occasionally hairy on the upper side. The five to seven rounded lobes are irregular, and the terminal one, occupying more than a third of the entire leaf has irregularly crenate margins. Crowded to the ends of the twigs are thick firm leaves, lustrous dark green above but silvery green and downy below. They turn dull yellow in the autumn, and do not hang on into the winter as do those of many other oaks.



With its characteristic irregular broadly rounded crown and gnarled branches, the Bur Oak is one of the largest and most majestic of the American oaks. It never grows in dense stands, but individually or in groups.

In May or June the blossoms of both sexes appear as the wooly leaves unfold. The staminate or male blossoms comprise slender, yellow-green, hairy catkins from four to six inches long. On the same tree, and frequently on the same branches will be found the reddish, hairy, pistillate flowers growing without a stalk, or so close to the twig as to have only a very short one.

Being of the white oak group, the fertilized pistillate flowers develop by autumn of the first year into clumsy, short stalked, broadly egg-shaped acorns, from three-fourths of an inch to two inches long, and more than half surrounded by a deep scaly cup. This cup with its fringe of coarse elongated scales is responsible for the common names, Bur oak, and mossy cup oak. Prolific crops of highly fertile seed are borne at frequent intervals. Their vitality is retained for six months to a year, with the result that seedlings are easily produced during the following spring on moist fertile soil. A strong tap root makes transplanting the seedlings difficult unless they are root pruned at an early age.

The scientific name *macrocarpa,* meaning large fruited, refers to the large nut whose sweet, white kernel is edible. The acorns of southern grown trees are usually larger than those of the north. *Quercus* is the Latin name for all the oaks, and is said to have been derived from the Celtic *quer,* meaning fine, and *cuez* meaning tree. The scientific name describing a fine tree with a large fruit is peculiarly apt in the case of Bur oak.

The flaky, grayish to reddish brown bark of old trees is one or two inches thick, cut by deep fissures into firm, more or less vertical ridges. Resembling that of white oak, the bark is firmer and the ridges are usually more prominent. First year branchlets are covered with greenish gray bark, turning to a light orange color, and covered for a short time with fine hairs. Later these twigs become dark brown and develop corky ridges or wings often an inch to an inch and a half wide. As the limbs mature, sections of bark are cast off to litter the ground below.

The light brown, close grained, hard tough heartwood with conspicuous medulary rays so resembles that of white oak that it is frequently classed with that species on the market. Under air dry conditions a cubic foot weighs about forty-five pounds, which is only two or three pounds lighter than the wood of white oak. No figures are available to show this country's existing stand of Bur oak as distinguished from white oak. It is used for furniture, interior finishes, vehicles, moldings, and veneers. Because of its durability in contact with the soil it is frequently used for railroad ties and structural material.

Bur oak never grows in dense stands, but as individuals or in groups associated with other bottomland trees such as pin oak, white oak, basswood, willow, cottonwood, black walnut, the hickories, elms, and soft maples. It grows well on rich, moist bottomlands and on lower slopes, preferring areas where water is available but not excessive.

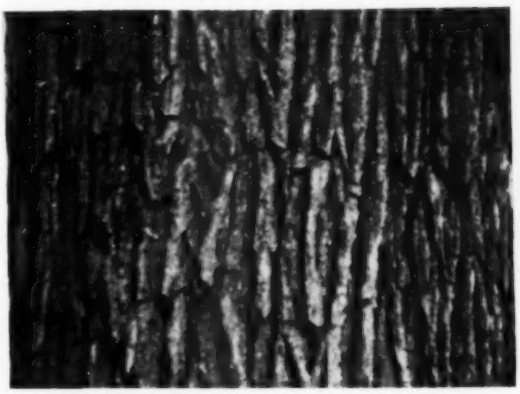
Of relatively slow growth, it reaches great ages and is not considered mature before 200 to 300 years.

Because of the damp sites on which it grows, fire damage is rare, while it is seldom injured by either insects or fungous diseases.

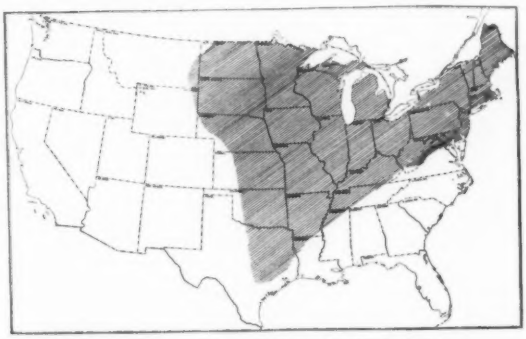
The sturdy unsymmetrical beauty of Bur oak, its remarkable ability to withstand damage from city smoke as well as its freedom from insect and fungous injuries, its adaptability to soils and climates, and the comparative ease with which it may be raised and transplanted recommend it for use on streets and lawns.

George J. Baetzhold, Jr.

The rounded lobed leaves of the Bur Oak, wedged shaped at the base, are the largest of all the oak leaves, being from six to twelve inches long and three to six inches broad at the upper half. The acorns are clumsy, short-stalked, and broadly egg-shaped.



The flaky, grayish to reddish brown bark of the older trees is from one to two inches thick, cut by deep fissues into firm, more or less vertical ridges. Resembling that of the White Oak, the bark of the Bur Oak is firmer and the ridges are usually more prominent.



Natural range of Bur Oak in the United States.

AROUND THE STATES

WITH

THE AMERICAN FORESTRY ASSOCIATION

Nearly 400,000 Acres Added to National Forests

Culminating the first meeting of the present fiscal year, the National Forest Reservation Commission, on September 30, approved the purchase of 392,665 acres in twenty-one states and Puerto Rico at a cost of $1,946,171.96, and passed a resolution urging the Bureau of the Budget to give favorable consideration to an appropriation of $10,000,000 with which to continue land purchases during the coming fiscal year.

The bulk of the lands approved for purchase are in Minnesota, Kentucky, Alabama, Missouri and Michigan, and total 256,275 acres to cost $1,133,610. Of these lands, 53,646 acres are in the Superior National Forest, in northern Minnesota, for which $114,873 has been allotted.

Most costly of all land in the recent program is a tract of 2,285 acres in Luce and Chippewa counties, in northern Michigan, to cost $86.81 an acre. Under an arrangement with the State of Michigan, these lands, which include the Tahquamenon Falls, described by Representative Roy O. Woodruff as the most beautiful example of natural scenery in the State, will eventually be held as a state park for which the State will exchange over 80,000 acres of state lands within or adjacent to the Hiawatha and Huron National Forests.

The next most expensive land is a tract of 6,595 acres on Mary's Peak, on the watershed of the city of Corvallis, in western Oregon, costing $49.44 an acre, or a total of $326,113. This heavily timbered tract consisting largely of mature Douglas fir is a key tract in the development of a sustained yield project in conjunction with adjacent private timberland owners, and on the Siuslaw National Forest. Timber sales will be conducted under the Forest Service continuing-yield plan, and in addition to furnishing local employment, will safeguard important water supplies.

Other western tracts approved for purchase at this meeting of the National Forest Reservation Commission include 160 acres on the slopes of the King's River Canyon, in the Sequoia National Forest, in California, 9,474 acres in Eldorado National Forest, and 3,524 acres in the Tahoe National Forest—both in California. In addition, 640 acres were added for protection purposes to the Provo National Forest, in Utah.

This meeting of the National Forest Reservation Commission was the first since the appropriation of $2,500,000 for the current year was available. Following action of the Commission at the meeting of June 30, 1936, the Forest Service submitted an alternate plan involving the possible purchase of 186,458 acres in Oregon, California and Maine at an estimated cost of $2,104,468. After considering opinions that the Emergency Relief Act of June 22, 1936, does not authorize purchases, and funds appropriated thereby cannot be used for that purpose, and further that the proposal including lands in the larger number of states was more clearly in line with the established policy, the Commission decided to approve the program involving the greater acreage with more individuals at less money. In approving the single project in Oregon, however, they made it clear that this action in no way prejudices the use of subsequent funds for the purchase of lands in Maine, in the northern redwood area of California, or in other parts of the West. At the same time it was pointed out that the Forest Service now has options on lands valued at almost $8,000,000 ready for immediate action.

HON. HARRY H. WOODRING

New Secretary of War and Chairman of the National Forest Reservation Commission.

Attending the meeting of the Commission were Secretary of War Henry H. Woodring, chairman; Oscar L. Chapman, Assistant Secretary of the Interior, who acted for Secretary Harold L. Ickes; Under Secretary Rexford G. Tugwell, acting for Secretary of Agriculture Henry A. Wallace; Senator Walter F. George, of Georgia; Representative Wall Doxey, of Mississippi, and Representative Roy O. Woodruff, of Michigan. Senator Henry W. Keyes, of New Hampshire, has signified his intention to retire from the Senate at the close of the present year.

Up-Stream Engineering Conference Urges Coordinated Program

Foresters, soil conservationists, agriculturists, biologists, and engineers assembled in Washington on September 22 and 23 for the Up-Stream Engineering Conference, which sought, in the words of President Roosevelt, in calling the meeting, "through forestry and land management, to keep water out of our streams, to control its action once in the streams, and generally to retard the journey of the raindrop to the sea."

Repeatedly, throughout the two day program, held in the auditorium of the Department of Commerce, speakers asked for a scientific program of coordinated research in headwater control, and land and water conservation. To this end engineers, agriculturists, climatologists, and other specialists were urged to cooperate. H. H. Bennett, chief of the Soil Conservation Service, expressed the wish that "we may ally our forces to defend ourselves against floods and soil erosion, for these are also allies,—but of destruction."

Conceding with other speakers, that there have always been floods, Mr. Bennett described studies of alluvial deposits revealing that sediment laid down in the past fifty to seventy-five years was brought down by more violently flowing waters than those of former times. Furthermore, he said, the recent deposits are coarser and less fertile than the earlier layers, showing that widespread stripping of natural cover has not only permitted the top soil to wash away, but is also removing sub-soil.

Speaking on the same subject, Earle H. Clapp, associate chief forester, United States Forest Service, said that factors favorable to absorption have been greatly reduced in many drainage basins of the United States as a result of exploitation of our natural resources. We have, he continued, an accumulation of evidence showing the intimate relation between increases in floods and erosion, and the increased depletion of forests and range cover.

Further supporting the belief that the periods of flood are increased and intensified by deforestation and improper use of the land, Inspector General Maghein, administrator of Waters and Forests in France, reported that flood periods in certain French rivers were nearly four times as frequent during the 19th century after considerable portions of the forest cover had been removed, than they were during the less developed period of the 18th century.

Waste of water and its attendant evils have already done more damage to the United States than war, declared Isaiah Bowman, president of Johns Hopkins University.

DYNAMITE

Controller of moisture

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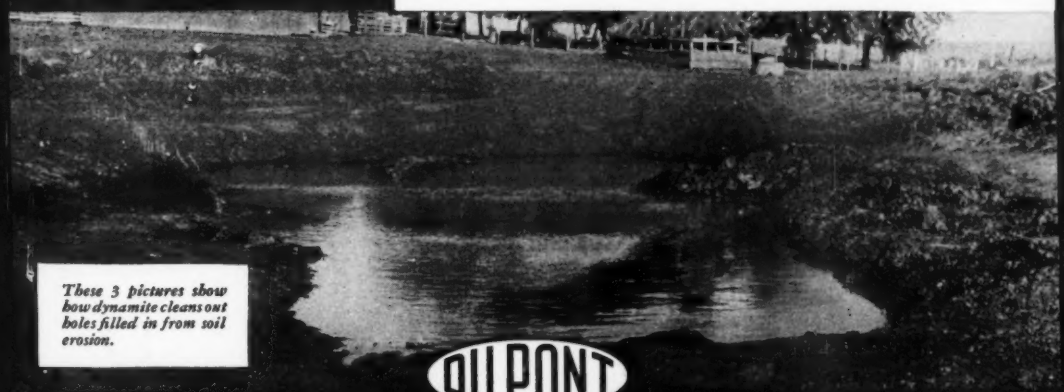

These 3 pictures show how dynamite cleans out holes filled in from soil erosion.

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RANGE BUILDING PRACTICES APPROVED

Approval by Secretary of Agriculture Henry A. Wallace of range-building practices and the rates of payment which stockmen may earn for performing them in the range-improvement program during the remainder of the calendar year 1936, was announced September 28 by the Agricultural Adjustment Administration for eleven western states.

The states for which the practices have been approved are: Arizona, California, Colorado, Kansas, Montana, Nevada, New Mexico, North Dakota, Utah, Washington, and Wyoming. Approval of practices for Idaho and Oregon is expected soon.

The range-improvement program in the western states will be administered by the Western Division of the Agricultural Adjustment Administration of which George E. Farrell is director.

"This program is open to all stockmen in the states concerned," Mr. Farrell said. "Participation by stockmen will be entirely voluntary. It will apply to privately-owned and privately-controlled land. Payments will be limited by the grazing capacity of each ranch."

The rates of payments and the specifications for each practice are the same in all states, but some practices are applicable only in certain states. All practices must be performed according to certain specified standards. The total payments for each ranch will be limited to an amount equal to two dollars times the grazing capacity of the ranch. For example, if the grazing capacity of a ranch is 500 cattle, the total payment may not exceed $1,000. No payments will be made where any of the practices are performed with labor, seed, or other materials furnished by a Federal or State agency.

The practices which have been approved and the rates of payment for them are as follows:

Contouring, sixty cents an acre; developing of springs and seeps, fifty dollars per spring or seep; earthen pits or reservoirs for holding rainfall, fifteen cents per cubic yard of fill or excavation; wells, one dollar per linear foot of well dug or drilled; water spreading, ten cents per 100 linear feet of permanent ditching; reseeding depleted range land, two and a half dollars an acre for reseeding with crested wheat grass, one and a quarter dollars an acre for reseeding with slender wheat grass, western wheat grass, or brome grass; range fencing, thirty cents a rod; rodent control, seven and a half cents an infested acre for prairie dogs, five cents an infested acre for kangaroo rats; fire guards, three cents per 100 linear feet; and railing sagebrush, fifty cents an acre.

BUREAU OF THE BUDGET TOLD OF FORESTRY NEEDS

Increased appropriations for forestry activities authorized under the Clarke-McNary Act, the McNary-McSweeney Act, and the Fulmer Act, together with adequate support for eradication of Dutch elm disease, were urged upon Acting Director Daniel W. Bell, of the Bureau of the Budget, by a group representing national organizations, on October 15. The conference was arranged for and sponsored by The American Forestry Association.

Representatives of the Association of State Foresters outlined to Acting Director Bell and his assistant, Colonel Charles L. Dasher, how the full authorization of $2,500,000 for cooperative fire protection, under Section 2 of the Clarke-McNary Act, would stimulate fire protection activities by the states. Fred W. Besley, Maryland State Forester, told the acting director that with the current appropriation of $1,655,007, to which the states and private timberland owners have added three dollars to every one of Federal money, an area of 243,000,000 acres of forest land in state and private ownership is under organized protection. Only one per cent of this protected land was burned over during the past year, he said. The damage on this area was estimated to be $5,000,000. In contrast to this, forest land aggregating 187,000,000 acres on which no organized forest protection is afforded, suffered fires aggregating 27,800,000 acres, or fifteen per cent of the total area. The damage was estimated at $28,000,000.

H. A. Smith, South Carolina State Forester, stated that twenty-five states have passed legislation permitting cooperation with the Federal Government in the acquisition of lands for state forests under the Fulmer Act of 1935. Urging an appropriation of $5,000,000, authorized in the Act, he described studies now being made of lands in South Carolina which, if purchased, would be so managed as to reimburse the Federal Government from receipts within a reasonable period, and thereafter prove an important asset to the state and the local community.

The campaign for the eradication of Dutch elm disease in the affected area of northern New Jersey, southern New York and southeastern Connecticut was described by Dr. William H. Rankin and Edgar G. Rex, in charge of the work in New York and New Jersey. The achievements of the past year demonstrate that with adequate and continuous support, Dutch elm disease can be controlled, according to Dr. Rankin, who further expressed the belief that the disease can eventually be wholly eradicated. Harris A. Reynolds, secretary of the Massachusetts Forest and Park Association, who represented the National Conference on Dutch Elm Disease, emphasized the need of a direct Federal appropriation of $3,000,000 with which to carry on the work during the coming fiscal year.

An appropriation of $10,000,000 for forest acquisition under the Weeks Act, as requested by the National Forest Reservation Commission, was supported, as were adequate appropriations for continuing the campaign for white pine blister rust control.

Increased support of the program of forest research, as authorized under the McNary-McSweeney Act, was urged by Dr. O. E. Jennings, of the University of Pittsburgh, and Dean Samuel N. Spring, of the New York State College of Forestry.

Attending the conference were: Fred W. Besley, State Forester of Maryland and a director of The American Forestry Association; F. C. Pederson, State Forester of Virginia; H. A. Smith, State Forester of South Carolina; L. N. Ericksen, Western Pine Association; Harris A. Reynolds, secretary, Massachusetts Forest and Park Association, and representative of the National Conference on Dutch Elm Disease; Dr. W. H. Rankin, in charge of Dutch Elm Disease Eradication for the State of New York; Edgar G. Rex, in charge of Dutch Elm Disease Eradication for New Jersey; Dr. O. E. Jennings, head of the Department of Biology, University of Pittsburgh, curator of Botany, Carnegie Museum, Pittsburgh, and member of the Allegheny Forest Research Advisory Council; Dean Samuel N. Spring, New York State College of Forestry; Henry Bahr, the National Lumber Manufacturers Association; Philip W. Ayres, director, The American Forestry Association; G. S. Prince, Association of American Railroads; and G. H. Collingwood, forester, The American Forestry Association.

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Undergraduate courses of four years are offered in forestry leading to the degree of Bachelor of Science. There is also opportunity for graduate work in several branches of forestry leading to advanced degrees.

The College has ample laboratories and classrooms in William L. Bray Hall and the Louis Marshall Memorial Building. It has forest properties approximating 20,000 acres that serve for demonstration, research and instruction in forestry.

Special laboratories for instruction in wood technology, in pulp and paper-making, in kiln-drying and timber-treating and a portable sawmill are other features of this institution.

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NATIONAL PARKS ESTABLISH ATTENDANCE RECORD

Traveling America set an all-time record of visiting its own National Parks and Monuments during the travel year ending September, 1936, with a seventy per cent increase over 1935.

One-fourteenth of the total population of the United States, or 9,929,432 persons, visited the 134 National Parks and Monuments, a gain of more than 4,000,000 over 1935, and a gain of more than 6,000,000 over the depression year 1931, when only 3,619,900 persons visited the areas.

New highs were set also for the number of persons visiting the parks in private cars. Registrations show a total for 1936 of 1,772,338, as against last year's total of 1,217,054.

Besides setting records for the national areas as a whole, this year's travel figures establish high peaks for the majority of individual areas. Of special interest to the section of the United States east of the Mississippi is the fact that the parks of this region were highest on the travel list. The highest total was scored by the newly established Shenandoah National Park in Virginia, dedicated on July 3, which was visited by nearly 700,000. Great Smoky Mountains National Park, in North Carolina and Tennessee, was second with 600,000 visitors. Acadia National Park, in Maine, reported 340,000 and Mammoth Cave National Park, Kentucky, 58,000.

Leading the record for the parks of the West, Rocky Mountain National Park, in Colorado, reports a total of 550,000. Yellowstone National Park, in Wyoming, with 432,000, comes next on the list, with Yosemite National Park, in California, closely following with a total of 431,000. Even Mount McKinley National Park, in Alaska, the remote scenic wonderland of the far north, reports 1,000 visitors, as compared with 800 visitors last year.

FECHNER ANNOUNCES NEW C.C.C. PROGRAM

The program covering the operations of the Civilian Conservation Corps camps during the eighth six-month period of Emergency Conservation Work, which begins October 1, has been announced by Robert Fechner, director of Emergency Conservation Work. It provides for the enrollment during the first fifteen days of October of a total of 109,276 new men as replacements for enrollees who have left the C.C.C. camps to accept private employment or who drop out of the Corps at the conclusion of the seventh period. The replacement program, which was ordered to bring the Corps up to its authorized strength of 350,000, calls for the enrollment of 97,525 young men, 7,120 war veterans and 4,991 local experienced men. The men will work out of 2,092 C.C.C. camps.

Preparations for the enrollment of the new men as fast as they are sent to physical examination stations in the various states have been completed by the War Department. All young men will be chosen by state C.C.C. directors of selection designated by the Department of Labor. The war veterans will be selected by the regional offices of the Veterans' Administration and the local experienced men will be selected by the Department of Agriculture and the Department of the Interior. No changes have been made in the eligibility requirements setting the age limits for juniors at between seventeen and twenty-eight years of age.

The program provides for an increase of 16,200 men in the requisitions of men from the drought states in the South and West to take care of young men from families now on public relief rolls because of drought conditions. The Director acted to adjust the requisitions for the drought states after the Department of Labor had reported that a survey conducted by C.C.C. state directors of selection disclosed that several thousand more men sought enrollment in the C.C.C. from these states than could normally be taken care of. The increases for the drought states, however, will not result in an increase in the authorized strength of the Corps, which is 350,000, as compensating adjustments were made in the requisitions of men called for from other states.

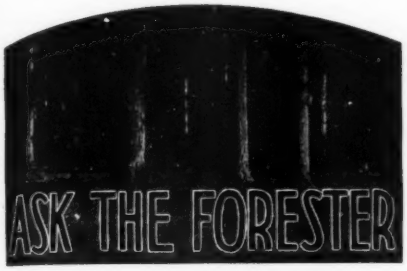
WEEKS LAW SILVER JUBILEE IN NEW HAMPSHIRE

A silver jubilee, celebrating twenty-five years of forest development in the East under the Weeks Act of March 1, 1911, was held at Bretton Woods, New Hampshire, September 13, 14 and 15, under the auspices of the Society for Protection of New Hampshire Forests and the United States Forest Service.

As one of the principal speakers, Joseph Hyde Pratt, formerly geologist for the State of North Carolina, and now a director of The American Forestry Association, told of the great fight for the Weeks Act in the southern Appalachian Mountains where the first National Forest of the East was created. After years of unsuccessful effort, during which former Speaker Joseph Cannon declared against the appropriation of a single cent "for the purchase of scenery," Mr. Pratt said the interest of New England was enlisted and the victory won. Mr. Pratt's address was amplified by Dr. L. C. Glenn, president of Vanderbilt University, who with Mr. Pratt was a member of the original investigating committee in the South.

Philip W. Ayres, also a director of The American Forestry Association, but who as forester for the Society for the Protection of New Hampshire Forests led the fight for the Weeks Act in New England, described the efforts of this organization and others in obtaining the passage of the Weeks Act, which made possible the establishment of National Forests in the East. Of particular interest were reports related by Mr. Ayres of a conference with the late Senator Chauncey DePew, of New York, whose influence was later instrumental in turning the tide toward passage of the Act.

Other speakers included Sinclair Weeks, of Newton, Massachusetts, son of the late Senator John W. Weeks, of New Hampshire; W. R. Brown, of Berlin, New Hampshire, chairman of the New Hampshire Forestry and Recreation Commission, and a director of The American Forestry Association; Franklin W. Reed, executive secretary of the Society of American Foresters; Tom Wallace, editor of the Louisville (Kentucky) *Times;* R. M. Evans, regional forester in charge of the National Forests of the northeastern states; John E. Burch, secretary of the National Forest Reservation Commission; Mrs. John F. Heck, president of the New Hampshire Federation of Women's Clubs; and Robert Fechner, director of the Emergency Conservation Work.



FORESTRY QUESTIONS SUBMITTED TO THE AMERICAN FORESTRY ASSOCIATION, 919 17TH ST., N. W., WASHINGTON, D. C., WILL BE ANSWERED IN THIS COLUMN. . . A SELF-ADDRESSED STAMPED ENVELOPE ACCOMPANYING YOUR LETTER WILL ASSURE A REPLY.

✣ ✣ ✣

QUESTION: Can you suggest any gums or resins which will give flames different colors when burned?—R. P. D.—Ohio.

ANSWER: Gums and resins, according to Dr. F. P. Veitch, In Charge of the Naval Stores Research Division of the Department of Agriculture, are carbonaceous materials consisting, in addition to carbon, of hydrogen, oxygen, and sometimes of other elements. None of the elements occurring naturally in gums and resins display emission bands which yield color effects. Instead, such materials burn with smoky yellow flames.

Colored flames are produced by characteristic light emissions from molecules excited by high temperature,—copper compounds give a green color to flame; strontium compounds a red color; barium, green; boron, green, etc. Actually, these color phenomena are the result of emission bands in the visible spectrum, and unless these bands occur in a fairly narrow region of the spectrum, colored effects are not produced.

It is possible to utilize gums and resins with other materials in such a way as to obtain color effects, in which case they furnish the fuel to heat the color-producing metallic compounds to the proper temperature. However, an oxidizing agent such as nitrate or chlorate is added to expedite the combustion of the resin.

QUESTION: On May 14 and 15 at night up here in the Adirondack on and about Piseco Lake the temperature went down to 26 degrees by the lake. The new leaves on some of the beech and ash trees were frozen and do not show signs of recovery. Will this kill the trees or will the trees leaf out next year?

—A. K. H.—New York.

ANSWER: Practically all hardwood trees, as well as many of the conifers, have reserve or dormant buds located immediately back of those from which the first leaves developed. In ordinary seasons these never materialize but "sleep" as do all buds in winter. To awaken them it seems only necessary to remove part of the shoot that lies above them. This may be caused by mechanical injury, the biting of insects or squirrels, or as in the case set forth in your letter when late spring frosts do the damage. Furthermore, the buds of many trees develop very early after the leaves are formed. It is possible that some of these may have progressed far enough to help supply the tree with necessary foliage.

Accordingly, the freezing will somewhat reduce the growth of the trees during the present year, but would be expected to do no material harm.

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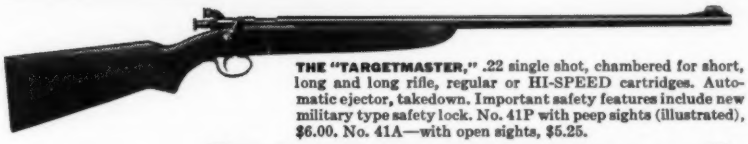
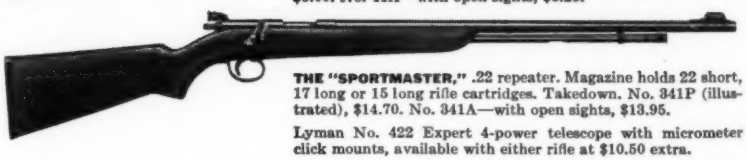


THE "TARGETMASTER," .22 single shot, chambered for short, long and long rifle, regular or HI-SPEED cartridges. Automatic ejector, takedown. Important safety features include new military type safety lock. No. 41P with peep sights (illustrated), $6.00. No. 41A—with open sights, $5.25.



THE "SPORTMASTER," .22 repeater. Magazine holds 22 short, 17 long or 15 long rifle cartridges. Takedown. No. 341P (illustrated), $14.70. No. 341A—with open sights, $13.95.

Lyman No. 422 Expert 4-power telescope with micrometer click mounts, available with either rifle at $10.50 extra.

AGAIN Remington makes rifle history! From their deeply crowned muzzles to their shotgun-style butt plates, the "TARGETMASTER" and "SPORTMASTER" rifles are designed to smack .22 bullets—HI-SPEED or Regular—precisely where you want them. Modern hooded front sights and adjustable rear *peep* sights, both with interchangeable discs, give you *eight* different sighting combinations to cover every shooting condition.

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(fill in, tear out and mail)

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919 17TH STREET, N. W.
WASHINGTON, D. C.

_____ 1936

Please enroll the following as members of your Association for 1937. Membership dues at $4 per year for each new member are enclosed. Mail them an engraved Christmas card bearing my name as donor.

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Seeks Information on Bird Protection

The International Committee for Bird Preservation, of which Dr. T. Gilbert Pearson is chairman, has opened a campaign to gather all possible information as to bird protective conditions in all foreign countries. The committee is particularly anxious to contact conservationists who have made observations on bird protective conditions in other lands.

"Within the past few months," says Dr. Pearson, "we have learned that in most of the countries to the south of us almost no attention is paid to bird protection. Great numbers of birds, including twenty-one species of ducks, many song birds and virtually all of our more important shore birds, pass the winter south. We cannot hope to rebuild our North American bird supply without the aid of our Southern neighbors." The headquarters of the International Committee for Bird Preservation are at 1775 Broadway, New York City.

President Pledges Wildlife Aid

Addressing the Mountain State Forest Festival at Elkins, West Virginia, October 1, President Roosevelt pledged to continue with "vigor and singleness of purpose for the next four years" the wildlife conservation program begun in his administration.

More than $20,000,000, he said, has been provided by his administration for the conservation of waterfowl, birds and other valuable forms of American wildlife. In addition, he pointed out, his administration has added 4,800,000 acres to wildlife sanctuaries, or two and a half times as much acreage as had been acquired by the Federal Government for this purpose in all the years prior to 1933.

"This work is now going on," he said, "and it will be continued with the same vigor and singleness of purpose for the next four years."

Massachusetts Launches State Forest Program

A bill calling for the purchase of 500,000 acres of land for state forest purposes has been passed by the State legislature of Massachusetts and signed by the governor. The bill provides that 25,000 acres may be purchased each year for the next twenty years at a cost not exceeding $5.00 an acre, or the total expenditure over a twenty-year period of $2,500,000. With this new law and appropriation the State of Massachusetts will own in state forests, at the end of twenty years, 662,000 acres, or about twenty-two per cent of the present forest land in the State.

Passage of this act is credited to the work of the Massachusetts Forest and Park Association. After a comprehensive study of state forest conditions, the association presented a bill to the General Court calling for the purchase of 500,000 acres of land for state forests during the next ten years. Under the state constitution the people may initiate legislation through the medium of the Initiative Petition, by procuring the signatures of 20,000 registered voters, to be distributed in not less than four counties. When the Initiative Petition reaches the legislature it must be acted upon by both branches, which may accept the legislation or propose a substitute.

The association initiated this petition for 500,000 acres in the fall of 1935. The bill then went before the various committees of the legislature, which held hearings on it, and a substitute was proposed by the Committee on Conservation. The substitute bill called for the purchase of 500,000 acres in twenty years instead of ten.

Book Reviews

JUST FISHING TALK, by Gifford Pinchot. Published by the Telegraph Press, Harrisburg, Pennsylvania. 238 pages, illustrated. Price, $2.50.

If you are one of those who revel in the tang of salt spray or the fragrance of mountain pine and fern—if you think of no thrill greater than the swift surge of a hooked fish—here is your book. It is the story—or stories, for there are twenty-three of them—of a great fisherman, a greater conservationist—Gifford Pinchot. From the mountain streams of Pennsylvania, the State he twice served as governor, to the scented isles of the South Seas, the author weaves a magic web of angling enchantment. It's ideal armchair entertainment, whether you're a fisherman or not. —E. K.

HILLMAN, by Frederic Brush. Published by the David McKay Company, Philadelphia, Pennsylvania. 50 pages, with illustrations by Betty Dawson Miller. Price $1.00.

This third book of Dr. Brush's poetry carries the true spirit of the people of the northern Alleghenies,—and is alive because he has lived long with them, and with the hills. He has well been called the Psalmist of the Susquehanna, for in his verse he has preserved forever the individuality of these mountain people. His characters live, his sweet philosophy lingers—long after we have laid down his book.—L. M. C.

MY PIONEER PAST, by Guy Waring. Published by Bruce Humphries, Incorporated, Boston, Massachusetts. 256 pages, ills. Price $2.75.

Guy Waring, college friend of Theodore Roosevelt, has written a dramatic narrative of his early struggle as a pioneer in the vanished frontier region of the northwest, now known as the State of Washington.

Bred of a long line of Connecticut farmers, the author was endowed with a hardiness and constancy of character which provided stamina equal to the rugged country to which he had migrated. In conquering hardship and disillusionment, he experienced a wealth of adventure which flavored his life. Of his joys and his sorrows, his happiness and his misery, he tells in a most fascinating and thoroughly readable manner which carries your interest through the three-year record of his pioneer life as cowman, storekeeper, barber, farmer, shoemaker, fur trader, and Justice of the Peace.

Mr. Owen Wister, a Harvard classmate of 1882, introduces Mr. Waring in the first pages of the book with his memories of the days when he traveled to the northwest to visit his friend.—D. D.

HANDBOOK OF OUTDOOR COOKING. Published by Mrs. O. R. Johnson, 411 Lathrop Road, Columbia, Missouri. 22 pages, paper covers. Twenty cents a copy.

This booklet was prepared through the cooperation of Camp Fire Girls, Scouts and Scouters to meet the need for something practical, adequate and inexpensive to guide "green cooks" in the woods—both youngsters and grown-ups. And it certainly fills its mission, with a line-up of recipes that zip up the appetite and make one fairly yearn for the smell of a woods-fire burning! And they are recipes that are amazingly simple, too, and capable of endless combinations. A list of straight-from-the-shoulder "do's" and "don'ts" for fire builders precedes the text and is a valuable addition for those inexperienced in the outdoors.—L. M. C.

SAPLING SAM'S COLUMN

Use Your Head

A woodpecker pecks out a great many specks
Of sawdust when building a hut;
He works like a nigger to make the hole bigger—
He's sore if his cutter won't cut.
He don't bother with plans of cheap artisans,
But there's one thing can rightly be said:
The whole excavation has this explanation—
He builds it by using his head.
—*The Makiling Echo.*

A Geology Quiz

Mr. Zwerp (in geology class): "What are the constituents of quartz?"
Harry Shortcake: "Pintz, sir."—*Octopus.*

Wood Products

Johnnie: "My sister has a wooden leg."
Freddie: "That's nothin'. My sister has a cedar chest."—*Widow.*

Few Cows

Cowboy: "How's the ranch?"
Second Cowboy: "Bully."—*Octopus.*

Freezing Aunty

"How can I make anti-freeze?
"Hide her woolen pajamas."—*Sniper.*

There was an old lady from Clyde,
Who was eating green apples and died.
Well, within the lamented
The apples fermented
And made cider inside her inside.
—*Indian Smoke Signals.*

Operator

Prof: "What is an operetta?
Dumb Frosh: "A girl who works in a telephone office."—*Saks Fifth Ave.*

Quips

If two people can sleep alone, why can't one person sleep together.—*Lyre.*

Advertisement: "Eskimo Spitz Pups for ten dollars apiece."—*Satyr.*

Brainless Betty wonders if it is possible to die in a living room.—*Kitty-Kat.*

"Just put it on my Bill," sobbed the young widow as she left a floral offering at the cemetery.—*Texas Longhorn.*

Town or Forest

Doctor—So you've had some pain in the lumbar region.

Trail Rider—And I've had it just as bad here in town as I had it up in the woods.

More Wood Products

"My most cherished possession is a walking-stick that has descended from father to son during the last three hundred years."

In each case, of course, it hurt the father more than the son.—*Washington Labor.*

Reorganization Committees Meet

The Senate Committee on Governmental Reorganization and the Committee named by President Roosevelt, met at the call of Senator Harry Flood Byrd, of Virginia, in the Senate Office Building on September 16. The initial discussion was devoted largely to the fields of activities for the two committees and to plans for further meetings before Congress convenes on January 3, 1937.

President Roosevelt's committee consists of Louis Brownlow, of the University of Chicago; Luther Gulick, director of the Institute of Public Administration, New York; William T. Gardiner, former governor of Maine; H. W. Dodds, president of Princeton University, and John D. Clark, of the University of Nebraska. The Senate Committee consists of Senators Byrd, of Virginia, Robinson, of Arkansas, O'Mahoney, of Wyoming, Townsend, of Delaware, and McNary, of Oregon. No meetings have been held by the House Committee, appointed on April 29, 1936.

Professorship in Wild Land Use Established at Michigan

Wild land utilization is the field covered by the Charles Lathrop Pack Professorship just established in the University of Michigan School of Forestry and Conservation. The new position represents an expansion of the activities of the George Willis Pack Forestry Foundation, established in 1930. The Foundation provided "for the promotion of practical forest land management in the broadest sense of the term," and the present grant will be used specifically for research in the basic principles underlying the use of our wild lands.

Lee Roy Schoenmann, at present supervisor of agricultural land classification in the Tennessee Valley Authority, has been named for the post. He is a graduate of the University of Wisconsin, was for eight years director of the Michigan Land Economics Survey.

Funds for the new professorship have been furnished as a three-year grant from the Pack Forestry Trust.

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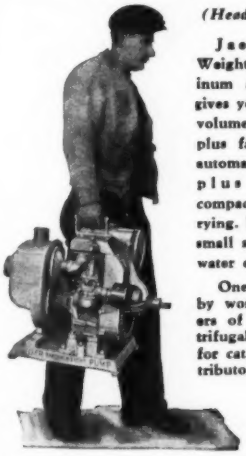

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WILDLIFE *HAS* A SENSE OF DIRECTION

(*Continued from page* 514)

America, from Alaska to southern California. This bird crosses the Pacific Ocean to rear its young on the islands of the Australian Sea, between New Zealand and Australia. The sooty shearwater, rearing its young on the islands in the vicinity of New Zealand and Cape Horn, ranges at other times the entire Atlantic Ocean north to Labrador and Greenland, and the Pacific Ocean north to the Aleutian and Kurile Islands. How can they do it unless provided with an unerring sense of direction?

When one has observed and carefully noted in the field the migration of birds for a great many years, one becomes all the more puzzled to know just what it is that enables them to cover twice yearly distances of many thousands of miles without faltering in their direction or without material loss of time.

From long observation and keeping records of the date of arrival of birds in a certain territory from the north on their southern migration and from the south on their northern migration, one is able to predict almost to the day, by watching the barometer—which indicates weather changes—just when certain varieties of birds will arrive. That there is a definite program governing their leaving their winter or summer homes, there can be no doubt.

While many birds are day-migrants, resting at night, by far the greatest number are night-migrants, resting by day. These night migrants certainly do not have the power of viewing the terrain over which they pass. Birds that have keen sight in the daytime are practically blind at night.

If migration was by day only and over land, sight may be of assistance to birds on short journeys when finding their way from place to place. It could not be of assistance, however, when the journey takes the individual over hundreds of miles of water, with no land in sight.

The sense of smell would be perfectly useless in following a migration route, as the air currents are constantly changing, and if birds had a highly-developed sense of smell, it would be impossible for them to follow the track of the preceding flocks.

Then, again, the first migrating flock would have no possible chance of using a sense of smell for none of its kind would be in front. Furthermore, it has been definitely demonstrated that the sense of smell is poorly developed in birds.

It is known that the sense of hearing in birds is acute, but it is not possible that this sense would aid them in migration, except insofar as to keep loosely scattered flocks in touch with each other.

Taste and touch have nothing, certainly, to do with guiding migration. We, therefore, must believe that birds possess at least one sense which human beings have lost—a sense of direction.

It is known that sight exists in the eye, that hearing is the sense of the ear. The nerves from these two organs transmit to the brain the sense governing sight and hearing. It is not known where the sense of direction is situated, but in whatever part of the body it is, there are delicate nerves which transmit the sense of direction to the brain, which in turn directs the individual bird to follow the right course.

The sense of direction is quite different from the homing instinct. The homing instinct is one which causes a bird to wish to return from some distant place back to its place of birth, or to its winter home. The sense of direction guides the bird on its way.

A number of years ago, Professor Watson, of Johns Hopkins University, conducted a number of interesting experiments on the ability of birds to find their way back home when forcibly taken and sent from their homes. His experiment was conducted from Bird Key, in the Dry Tortugas, off the southern tip of Florida, where there is a considerable concentration of nesting sooty and noddy terns. After capturing a number of these birds, he stained their feathers with aniline dyes, using various colors, so that he might easily identify them, should they return. He then caused a number of these colored birds to be taken considerable distances. The first long distance was to Havana, Cuba, a distance of about 175 miles. They were released in the morning, and the next day returned to their nesting home. Then, he captured three noddy and two sooty terns, sent them from their Bird Key to Key West, where they were placed on a northbound steamer. These birds were liberated off Cape Hatteras near the coast of North Carolina, 1,080 miles over the water from Bird Key. Three of the five birds liberated returned to their nests. The other two failed to return and were probably injured or weakened by being penned and transported in a coop.

Professor Watson then sent a number of sooty and noddy terns, the plumage of which he had colored, across the Gulf of Mexico by steamer to Galveston, a distance of 870 miles from Bird Key. Six days later the first of these birds came back to Bird Key, and others returned during the next few days.

It is quite impossible that these birds could have known the direction in which they were being sent, as they were confined in a coop in the vessel. There was no land which would aid them in making their return journey, and they could not have observed the water over which they were being transported. There is no doubt that these birds returned to their home site through the ability given them by their sense of direction.

From our knowledge of the twice-a-year migration of birds of the northern hemisphere—first, from the locality in which they first saw light of day to the locality in which they spend the winter, and second, from their winter home back to the locality of their birth—it is quite evident that there is an equal attraction in both directions, for both journeys are made with the same punctuality and determination. These migrations at first were probably very short, made necessary by climatic variations and changing of food supply. As physical and food conditions became more varied due to climatic changes, the distances to be traveled in order to meet their desired

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living conditions became more protracted, until great distances are now covered between the nesting and wintering grounds of species whose nesting and wintering homes were at first near together. During the millions of years in which climatic changes have made longer and longer migrations necessary, birds have developed a sense of direction that has enabled them to travel thousands of miles over land or water, and return to the original starting point at will. This fact is proven by the birds themselves as recorded by man since the dawn of history.

Birds that nest in the north, and spend their winters in the deep south, are undoubtedly urged by their instinct of reproduction to start on their northern migration in order to build their nests and rear their young in the locality in which they were reared. The memory of a pleasant winter climate and abundant food supply probably is the factor that starts them south again. The sense of reproduction is the instinct that starts the bird on its journey to its breeding grounds. The homing instinct is the factor that starts them south again. The sense of direction is what causes the bird to complete its journey to its home, and without it they could never carry through whether headed north or south.

Birds are so constituted by nature, that the reproduction instinct comes to them in the spring, and in the spring only. They could just as easily rear a brood in their winter home, for the temperature and terrain and food are practically the same as that prevailing in their summer home, but nature does not call for the expenditure of the strength and the energy necessary to rear two broods in a single year. They, therefore, use the long period between the end of the nesting season in summer and the beginning of the next spring to gather strength and energy with which to bring forth the new brood.

Having been aware for many years through close observation of migratory birds, that there was a strong tendency for birds, especially wild fowl, to return each year, not only to the place in which they were reared, but each fall to their winter home; and, knowing that the wild fowl from their breeding grounds in the northern United States and in British and Arctic America used three main migratory routes—the central being known as the Mississippi Valley, the western being along the Pacific Coast, and the eastern along the Atlantic Coast—I determined to send from Louisiana, which is in the southern central edge of the Mississippi Valley route, wild fowl, by express, that had been caught on the Gulf shores and properly banded, to the Pacific Coast and to the Atlantic Coast. My object was to determine whether or not they would return to their winter home on their subsequent southern migration.

My first experiment was begun on February 12, 1918. Having made arrangements with Dr. Arthur A. Allen, Biologist of Cornell University, to release the birds on arrival, the shipment was made and consisted of mallards, green-winged teal, scaup and coots. There were eighty birds in this first shipment.

Dr. Allen liberated these birds on Cayauga Lake, in New York, promptly upon their arrival. Within the next few years twenty-six of these birds were retaken and their bands returned by those who killed them to the American Bird Banding Society, who had supplied the bands. All but one were retaken in the Mississippi Valley migration route. A number of the returns were retrapped at Avery Island, in Louisiana, once or twice before being shot in some other location. The latest birds recovered were: a mallard, shot at Lake Thompson, South Dakota, in 1924, and a green-winged teal killed at Caddo Lake, Texas, also in 1924. Ninety-six per cent of the returns from these banded birds were from the Mississippi Valley flyway.

After the United States Bureau of Biological Survey took over the American Bird Banding Society in 1920, I made arrangements with the Survey to furnish the bands and have their game protectors liberate wild fowl that I would ship to them from Avery Island. The stations chosen for liberating these birds were at Berkeley, California, Moiese, Montana, Voltage, Oregon, Washington, D. C., Cambridge, Massachusetts, and Cape Cod, Massachusetts.

I have shipped many hundreds of ducks from Avery Island by express to these different stations for liberation, timing the shipments to arrive just before spring migration would start in the different localities, taking care to select varieties of wild fowl that were normally plentiful at the localities designated, so that the birds shipped from Avery Island would at once on liberation mingle with birds of their own variety and species.

A great many returns have been recorded, and of these eighty-six per cent have been returns from the Mississippi migration route.

This series of shipments has been made in ordinary slatted coops by express. There was no possible chance for these birds to observe the terrain over which the trains traveled; therefore, they could not have received any "cues" during their journey by train from Avery Island, which would assist them in returning to the Island or their original migration route. Some of these birds have been retrapped as many as five different seasons at my Avery Island banding station, and many of them have been shot in southern Louisiana.

This is conclusive evidence that wild fowl, at least, have not only a strong tendency to return to their original migration route if forcibly removed from it, but have a strong tendency to return to the same spot from which they have been forcibly sent.

In 1918 I sent for liberation a number of mallard ducks to Ogden Armour's place on Lake Geneva, Wisconsin. The ducks from one of these shipments were liberated on the sixth day of December. The birds, when released, bore the bands of the American Bird Banding Society, and Mr. Armour's private bands. My trap man, in taking ducks from my banding trap on the morning of December 7, reported finding one of the ducks that had been banded and shipped to Mr. Armour several days before. This bird had made the trip from Lake Geneva to Avery Island in twenty-four hours.

Several years ago the Department of Conservation of the State of Louisiana requested me to send to Audubon Park, in New Orleans, for liberation on one of their lakes, a mallard hen with a brood of young. New Orleans is 126 miles east of Avery Island. Shortly after getting this request, a mallard hen hatched a brood of eight young. The mother and young were put in a box and sent by express to Audubon Park for liberation. About ten days later, I had a letter from the Park Superintendent saying that rats had killed all but one of the young ducks, and asking me to send another brood. The next day he telephoned me that the rats must have gotten the other young and the mother as well, as both had disappeared. As soon as I received the telephone message I went to the Game Farm and asked Nathan Foreman, in charge, if he had another mallard hen with young, telling him that the rats had destroyed not only the brood, but the mother duck, which we had previously sent down. His reply was that the mother duck had came back to the Game Farm that morning.

The birds possess senses other than sight, smell, hearing, taste, and touch—there is no doubt. They must possess sensory nerves of which man knows nothing, giving to them sense perception not understood by man. These enable them to communicate with each other through great distances, and to unerringly travel the—for them—uncharted seas.

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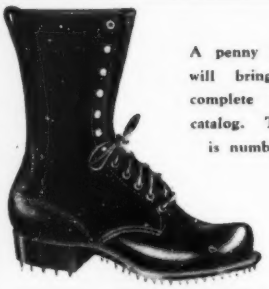

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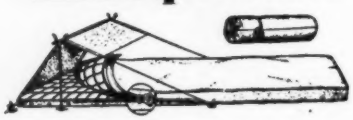

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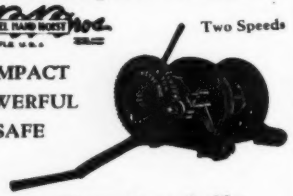

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FORESTRY AND FLOODS IN THE TENNESSEE VALLEY

(*Continued from page* 504)

forms of treatment.

While the work of determining the best methods of the retardation of water and reforestation was being tried out, vitally important studies as to the location, areas, conditions and contents of the forests of the whole Tennessee Valley were begun, as it is just as important to protect and develop the forests which already exist as to plant new ones, as far as water-control is concerned. Trained foresters, therefore, have been carrying on field investigations of a highly technical nature, tied in with social and economic features such as the present and probable future number of people living in and depending upon the forests for livelihood; the present and potential resources of wood available to industries, and the suitability of the forests for permanent forest management.

However, the relationship between forest vegetation and control over the run-off of water must go further than soil erosion prevention work, reforestation and forest management planning. There is great need for a thoroughgoing demonstration of how forest lands should be handled under good forest management. With fifty-two per cent of the land surface of the Valley in forest, it is eminently worthwhile to show exactly how trained foresters handle forests, protect them from fire and how soil erosion prevention and the creation and maintenance of a forest cover fits into the program. With this in mind, the lands bought by the Tennessee Valley Authority around Norris Lake for protective and other purposes and for control over the shoreline, have been allocated to the T.V.A. foresters to administer.

The creation of the Norris Lake Forest provides the foresters with an opportunity to lay out fully and put into practice the proper treatment of land with full authority as to the work. As a demonstration area, and as a base for continuous investigation, the Norris Lake Forest of 117,000 acres is rapidly taking form. It is already a very important source of information from which Congress will be able to formulate further plans for the development of forestry knowledge as it relates to control over the run-off of water and soil erosion prevention.

The foresters of the Tennessee Valley Authority are learning more and more about those phases of forestry dealing with control over the flow of water. They are extremely interested in cooperating in research with agriculturists, engineers and foresters, in scientifically attacking run-off and silting problems on complete watersheds and in relation to specific dams in the Valley. A second, practical foundation has already been laid on the rule-of-thumb basis. The more scientific and detailed studies can now begin.

For the first time in history, a great nation has set aside an extensive watershed for the purpose of learning how to control the run-off of water. The Tennessee Valley Authority is undertaking this work in a thoroughgoing manner by means of a united front of technicians. The foresters of the Tennessee Valley Authority are the shock-troops preparing to meet the enemy of uncontrolled waterflow, where the precipitation first touches the ground.

JOSHUA TREE FOREST

(*Continued from page* 499)

between the two deserts.

In the northern portion of the new government reserve, between Monongo Valley and Twenty-nine Palms, there is wide growth of that strange tree for which the Monument is named, and in one spot there is a very extensive group of several hundred acres.

This Joshua tree is a plant which arouses diverse responses in different natures. There are those who see in its wierdly spreading, grotesque branches and astonishing angles, symbols of strength and hope—they even see in it often the cross which is the mark of Christianity. So it impressed the Mormons who gave it the name of Joshua; a leader of a desert people, pointing the way to a new Promised Land, as a little band from Salt Lake penetrated these deserts on the way to California, in 1850. To others the Joshua tree is an ugly, menacing object, "more like some conception of Poe's or Dore's than any work of a wholesome Mother Nature."

From this it may be concluded, rightly, that the Joshua is a tree of personality, no soft thing to be ignored, but a sentinel of the desert which will bring some sort of emotion to every beholder.

And a persistent thing, both in memory and in history. That the Joshua is the oldest living plant of the desert is the almost universal conclusion of all botanists, though they disagree by as wide a margin as three thousand years in fixing its probable age. The general opinion appears to be that while it cannot reach the longevity of the Sequoia, it is among the oldest of plant life known to mankind.

Yucca brevifolia is the botanic name of the Joshua tree and it is of the lily family, with very slow growth. This tree yucca reaches up to twenty-five or thirty feet in height, with strong, stiff arms and tufts of blade-like leaves at the end of the branches. It blooms in early spring with a whitish, bell shaped flower in large clusters, followed by a short thick pod which remains closed when dry and which contains a black seed that primitive Indians used to grind for meal.

Twenty-Nine Palms, the desert hamlet at one corner of the Joshua Tree Forest, lives up to its name in having one of the most picturesque of all the groups of fan-palms, *Washingtonia filamentosa*, for which the Colorado Desert is famous. This palm is also occasionally found elsewhere within the new National Monument, but never in dry soil. It grows up to seventy feet in height, with fronds of light green, and stringy filaments. It blooms in early summer, a small creamy flower in long, drooping clusters and the fruit is a small hard berry, black and sweet when ripe but not to be confused with the fine dates which are grown in nearby Coachella Valley, where the best of imported date palms have created a new American industry.

Next to the Joshua and the palm, by all odds the most appealing tree of this new desert reservation is the California juniper. From Inspiration Point, in the San Bernardino Mountains, the junipers are particularly impressive. It may be recalled that Pliny declared that the serpents shun this tree and man may therefore sleep safely in its shade. Many a "desert rat" who never heard of the ancient and too-often-incorrect naturalist, believes the same thing.

The beautiful smoke tree also is found in many a Colorado Desert wash. The smoke

tree, or Indigo bush, formerly was scientifically called *Dalea spinosa*, but botanists appear to have had a hard time making up their minds, as it is now classed as *Parosela spinosa*. It is a practically leafless bush that grows as high as fifteen feet; a mass of whitish, spiny twigs with never a sign of a leaf. From a short distance away the smoke tree looks like the smoke of a lazy fire. In early summer it bears small, dark blue flowers much like pea-blossoms.

Cacti, of course, abound all over the Joshua Tree National Monument. Perhaps the chollo or deer-horn cactus is the most striking, a branching cactus that is seen everywhere. The most romantic is the nigger-head or barrel cactus, a cylindrical, ribbed growth which will give water to wandering man if he cuts off the top and pounds up the pulp inside. The most sought is the fish-hook cactus (*Mammillaria tetrancistra*), a tiny thing about two inches high and approximately the same diameter, which has a sharply hooked black spine in the center of each tuft.

Often mistaken for a cactus but actually of a different family (*Fouquieria splendens*), is the ocotillo or "candle-wood." It is a sheaf of thin, whip-like canes from six to twenty feet high, spreading out from a main stump. As each cane is protected by thorns, the idea of calling it a cactus is not far-fetched. It is gaunt and seemingly lifeless for ten months of the year, but the coming of rain works a transformation. Its long stocks become green with suddenly appearing small leaves of vivid hue, soon a flower-spike appears at the end of each cane and becomes a flaming tongue nearly a foot long, of scores of tubular scarlet and yellow blossoms. Caught in bloom it is one of the most colorful of desert spectacles; at any time its bare limbs waving in a breeze are striking in more than one sense.

These are but a few of the specimens of desert vegetation which the Joshua Tree National Monument is designed to protect in their native state. Others include desert tea, desert lily, mistletoe; galleta desert, spear and desert dropseed grasses; desert trumpet and desert buckwheat; sand verbena; four o'clock; California poppy; peppergrass, tansy Mustard and spectacle-pod; bladder-pod; mesquite, screwbean, senna, palo verde (sometimes a sizable tree), ironwood, lotus, creosote bush, turpentine broom, spurge; desert hollyhock and desert fivespot; sandpaper plant and stickleaf; desert primrose and evening primrose; milkweed; gilia phlox; desert lavender; thorn apple; monkey flower; desert willow; plantain; desert star, aster, desert sunflower, coreopsis; spanish needle; pincushion flower; and desert dandelion.

This is the second desert National Monument which Mrs. Sherman Hoyt has been instrumental in securing. Upon President Hoover she urged and secured the proclamation which created Death Valley National Monument, also of approximately 800,000 acres. Though there may be more public curiosity as to that one, due to the fact of its being the scene of a famous tragedy of pioneer days and of its being below sea-level, the newest monument is of far more importance to desert lovers.

The exhibit from the Colorado Desert which Mrs. Hoyt sent to London in 1929 caused one of the greatest botanical excitements ever known in England. In the foreground of the display were mounted specimens of several desert animals and the *London Times* ran a leader in which it declared that "Two coyotes have captured England." Mrs. Hoyt gave a glass house to protect the living plant exhibit and it is still, seven years later, one of the most popular attractions in Kew Gardens.

To further her plans for desert conservation, this Pasadena woman organized the International Desert League about five years ago. She made it truly international by enlisting the enthusiastic support of the Mexican Government on a visit there in 1931. At that time Mrs. Hoyt had conferred upon her an honor never before given a woman; she was made a Professor Extraordinary of Botany, with all the privileges of a doctorate degree, by the National University of Mexico which is, by the way, the oldest institution of higher learning on this continent. Incidentally, it might be mentioned that this conservationist is also the only woman honorary member of the Royal Horticultural Society of Great Britain and likewise the only woman honorary member of the Horticultural Society of Germany.

THE MAPLE

The Maple tossed her auburn head
And breathed a gentle sigh
"I've wearied of this habit brown
Come, winds, and bid it fly.
This winter's circle I shall clown
In ermine masquerade,
The while I wear within my heart,
A gown of tender jade."

—Catherine L. Barker

PARKS FOR THE MILLIONS

(*Continued from page 507*)

geology and archaeology, as they erected and installed the park museum designed similarly to initiate park visitors into the secrets of this plan. Many communities selected landmarks and sites associated with their history for incorporation into county or metropolitan parks. Prehistoric relics were similarly made park nucleii in other sections.

All these diverse types of park furnish recreation in its true sense—recreation of man's three-fold nature. For who shall attempt to draw the line between enjoyment and education as recreational assets? It is but a step from the awed interest evoked by visits to the homes of heroes, and the inspiration derived from pilgrimages to shrines that perpetuate great moments in our national history to the desire to be better informed as to their meaning—and perhaps more worthy of the sacrifices and victories they memoralize. Every new vista of nature, whether perceived in a field trip, in a wayside museum, in a prehistoric ruin, or in geological phenomena broadens the mental horizon and gives new meaning to the universe. Hours spent in so-called idleness, watching the little creatures of the wildwood not only relax tense nerves, but tremendously enlarge cosmic perspective. Even the superficial observer gains some inkling of what is meant by biotic balance after a week-end spent in nature's sanctuary.

The enchantment that resides in a campfire cannot be matched anywhere else in human experience. Friendships and memories are born of its glow and fragrance that endure through life's span. For young people to be deprived of such enriching experiences is little short of a calamity.

True recreation in such guises as these await the American people in 1,142 State Parks, thanks to the program financed by the Emergency Conservation Work since the establishment of the C.C.C. Because of the existence

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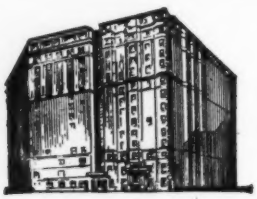

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of these areas and the recreation facilities they provide uncounted hosts of nature-hungry mortals may now, within a few hours after closing the doors of office or kitchen, step into the world of the out-of-doors awaiting them in nearby state, county, or metropolitan park, or recreational demonstration project. Hiking and camping, too long regarded as beyond the reach of the person of average means, today are within the realm of possibility even for those physically below par. For trails give access to steep cliffs which once only the trained athlete could safely scale; nearby marvels comparatively unknown because lost in tangled thickets and treacherous swamplands, have been made accessible. Yet these trails are so artfully landscaped that the hidden loveliness which they traverse has not been cheapened by opening a way to them.

"Who cares whither a footpath leads?" Thomas Wentworth Higginson once asked. "The charm is in the footpath itself; the promise of something the highroad cannot give." Could the New England historian return to earth today he would be amazed to learn that the footpath has become so well established in the lives of the American people that it constitutes one of the main features of every park. If all the footpaths and bridle trails built by the C.C.C. were joined together, end to end, they would reach from San Francisco to New York.

Along these winding trails the people of the United States are finding their way back to nature and her great reservoirs of peace. To be with nature is to desire to understand her better and with such understanding comes dawning reverence for her laws and the resolve not to do them violence. No more potent influence for the cause of conservation can be generated than that which springs up spontaneously in the heart of every mortal who has opportunity to renew his contact with "the smell of the woods, * * * the wind in the trees, and to lift up his eyes to Mother Nature."

A NORTH AMERICAN MARCO POLO

(*Continued from page* 511)

of scented wood that would appeal to the Oriental market, a wood that was valuable for dye, or incense, or carving, or manufacture, or all of them, either in Eastern or Mediterranean marts, it is not to be expected that they would hasten to make its existence known.

What, then, of the stinking yellow wood?

Technicians of the United States Forest Service believe that of all Pacific coast woods some one of four is most likely to answer the description. They are: "stinking cedar," of which there are several kinds; incense cedar; Alaska or yellow cedar; and Port Orford cedar. Though none of these is listed today as a valuable dye-wood, it is a known fact that Indians used cedar woods for dyeing and it is probable that color extracted either from the wood or from the bark of these trees could be used as a dye.

A certain objection—botanical range—obtains against nearly all of these trees as one attempts to fit them into Moncacht-apé's picture. But botanical range, as set down today, does not apply in all cases to contemporary distribution of trees, nor can it be applied except within the range of likelihood to a time as early as the travels of Moncacht-apé.

The wood of the various stinking cedars is of a clear lemon yellow. Green parts, when bruised, give off a "pungently aromatic or ill-smelling (fetid) odor," according to Sargent.

Incense cedar has a markedly aromatic odor. Its wood is of a pale or dull yellowish brown tinged somewhat with red. Its range is through California and southern Oregon, but not quite so far north as the Columbia river.

The wood of Alaska or yellow cedar is of a bright clear yellow, and has an agreeable resinous odor. Its range touches the inland Columbia river country, and it grows along the coast proper of southern Alaska and British Columbia. Even today there is a small trade in Alaska cedar logs shipped entire to Japan.

Port Orford cedar has a light yellow to pale brown wood, with a spicy odor and taste. This tree is made conspicuous by feathery weeping branchlets of a deep yellow-green. Its range today is rather strictly limited to northern California and southern Oregon, along the coast. It, too, is exported to Japan.

"The stinking yellow wood that dyes a beautiful yellow" may have been one of these. The question yet awaits its fullness of answering. Old history recedes into an ageing mist of yesterdays. But the tomorrows, marching ahead into their own mist of time unborn, pierce the veil in both directions. A day may come when a learner of things both old and new will join them together and give a name to Moncacht-apé's "stinking yellow wood."

WILDWOOD MAJESTY

(*Continued from page* 493)

natural sanctuaries; and I wish I had even a depression dollar for every flock of these splendid birds that I have seen flying to roost. In taking the trees they make little noise until their wings strike the limbs and branches. That sound, once identified, can always be recognized again. On a still evening it can be heard a quarter of a mile away. Contrary to general opinion, wild turkeys rarely roost high; and they prefer evergreens to bare trees, for obvious reasons. Many a time, in starlight or moonlight, I have walked under a whole flock roosted in young pines, not over thirty feet high. When a wild turkey roosts in a bare tree, he cannily selects one that has in it old squirrel nests, bunches of moss, clumps of mistletoe. He knows the worth of camouflage.

When flushed from the roost at twilight or at night, turkeys invariably alight in other trees, usually absurdly nearby; when flushed in the morning, they nearly always alight on the ground. In a lifetime of studying them, I never knew one to alight on the ground at night. They have too wholesome a respect for foxes and wildcats.

While these great birds attain a size almost mature when they are a year old, it is a little known fact that they do not breed until they are two years old; and it is only after that age that they develop their full beauty and grace. There may be exceptions, but this is the general rule.

Walking one April day out of my plantation gateway, I turned to the left, around the aromatic borders of Spencer's Pond, where the sweet bays and gallberries shimmered in the sunlight. Festooning the bushes and covering the prone and unlovely helplessness of fallen trees, and climbing high on the dark boles of the yellow pines and the tawny shafts of the cypresses, the jasmine and the Cherokee rose made the woodland bright with their beauty. Over the forest rested the mute rapture of deep-hearted peace. When I came to what we call Dogwood Hill, a name given long before the Revolution, I heard, and then saw,

about a hundred yards from me, a wild turkey hen take wing, and fly far off through the glimmering forest. As one of these birds always prefers running to flying as a method of escape, and as I could not imagine that anything had suddenly so frightened it as to make it take the air, I believed that I had come upon its nest. The wild turkey hen nearly always flies from and to its nest. This maneuver is, of course, designed to prevent intruders from following her, or following her trail to her precious eggs. To me it is a very impressive thing to see one of these wary mothers, unaware that any one is watching her, thus with sensitive precision and dutifulness perform her loving and sagacious ritual. It is almost like a form of worship. The gobbler in the mating season becomes more beautiful, less wary, more combative; the hen is likewise transformed, but in a far more subtle and profound manner. On her rests the continuance of the race. The gobbler is contented with the triumphs of today, but the hen is concerned with the future of her children. Ordinarily so wild that she rarely ever permits a man to see her, when she is on her nest I have gone up and laid my hand on her back. There is something in the power and the courage of motherhood that is both mysterious and invincible. Nature seems to supply a quality essential to the continuance of the species.

I found the nest of the hen that had flown away: it was on the edge of a bay-branch, deeply set in broomsedge, and overarched by the tender and fragrant gloom of the bay-leaves. There were twelve eggs in it. I suppose that few people have ever seen a wild turkey's nest; for it is found in such wild country, and the mother's secretiveness is such that it is exceedingly difficult to discover. I peered at it warily, and then walked away, determining not to visit it again for fear of frightening the bird away permanently. But I made up my mind to try to follow the fortunes of this wildwood family.

About six weeks later, ranging the same woods, I came upon the mother and her young. At the time there was a drizzling rain; and the mother, under some young pines, had fluffed herself out, so that her whole brood was under her. I caught sight of tiny pearly bills and elfin eyes peeping forth from the shelter of her feathers. When there is a rain, the wild turkey hen will rarely move or let her young move. They get draggled easily, and then pine and die. Indeed, until they can fly to roost, the mother ranges over a very limited area, perhaps not more than an acre or two, so that if one knows where she has nested, she can usually be found in that neighborhood.

About two weeks later, in the radiant dusk of a May twilight, I was passing through a dense pine thicket on these turkeys' range. I heard the little ones calling, and the deep reassuring note of the old mother. Of all the sounds of nature, the piping of the baby wild turkey is to me the most appealing. Flute-like, and as delicate as if it came out of fairyland, this note thrills the heart with its winsome and tender wildwood beauty. The song of the veery, the bleating of a tiny fawn, the faint nursery babble of baby wild ducks—these too are appealing; but the voice of the elfin wild turkey is that of Titania herself.

Stealing along toward this family gathering, I came at last in sight of the mother and her young. She was teaching them how to go to roost! I lay down beside a pine; and, with the last lights from the iridescent sunset softly suffusing the lonely woods, I watched this lovely performance. The mother kept walking round and round, talking to her babies, telling them that they were big children now, and could sleep 'way upstairs. I saw her studying the various trees for a suitable one in which to try the great hazard. Finally satisfied, she flew up—to the dismay of her brood, every member of which redoubled his pipings. "Why, Mother," they seemed to be protesting, "you can't do that! Look where you've left us!"

The mother flew down, and I could hear her giving her babies more specific directions and loving admonitions. When she flew up again, she alighted on a big limb about twelve feet from the ground. Then, one after another, the fairies rose, until eleven were on the limb with her. Her last and least essayed the great adventure, but he alighted on top of a bush, about seven feet up. Then such motherly cajoling and encouragement! At last he, too, joined his brothers and sisters; and there they were ranged rather teeteringly on either side of her. Then followed what has always been to me one of the tenderest scenes that I have ever seen in nature.

The mother gently lifted her wings, and spread them out, holding them in that position, with all her brood sheltered under them. I thought: The night comes on apace; and in that darkness are fatal enemies. Here Love holds wide her wings; here the mother-heart offers itself for a refuge. As long as there was light, I looked fascinated upon the pathos and the beauty of that woodland picture. It was a magic casement, framing a vision of real yet idyllic mother love.

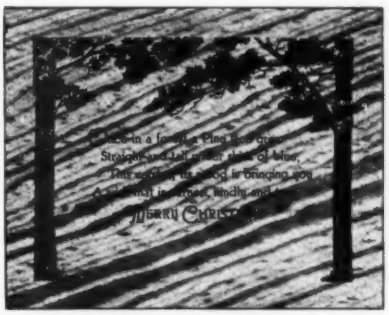
When I was a boy on the plantation, a little wild turkey strayed in from the woods, and was adopted by a hen of our tame flock. He grew to be a magnificent gobbler, and for many years was the patriarch of the turkey family. The half-wild birds that were bred from him were neither wild nor tame; they were very beautiful and hardy. They would never come very close to the house; and they always roosted in a huge elm standing on the edge of a little ricefield. At twilight they used to line up in the road at some distance in front of the house and fly to roost in the great tree. I remember seeing as many as sixty going up one after the other.

Most birds' legs are so constructed that when the knee bends, the toes automatically close. Because of this, turkeys will sleep out the wildest gale. I have seen them rocked perilously. One night, though there was a clear full moon, we had a visit from the tail of a West Indian cyclone. I was up all night, caring for the stock and attending to the other duties incident to such a time. I had the turkeys in mind; and while watching them, the old tree, weakened by a hollow at the bottom, began to sag and to crack. In a few moments it gave way with a noise like thunder. My eyes were on the great birds roosted in its branches; and I saw them ride the mighty tree to the ground. Even in that wild rush to the ground, not one of them stepped off or flew. They came down with the tree. And next morning we found not a single bird injured or missing.

MATURITY

By Edith Anisfield Wolf

Ripe leaves
Waving farewell
With carmined fingertips
Float from the parent maple tree--
It's Fall.



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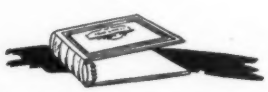

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Index to

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PAGE

American Fork and Hoe Company 529
American Telephone and Telegraph Company ..... 2nd Cover

Bartlett Manufacturing Company 528
Beebe Brothers 530

Caterpillar Tractor Company 523
Cleveland Tractor Company, The 4th Cover
Cutter Shoe Manufacturing Company, A. A. 530

DuPont de Nemours & Company, Inc., E. I. 521

Fechheimer Brothers Company, The 532

Herbst Brothers 528
Hough Company, Romeyn B. 533

Idaho School of Forestry 524

Jaeger Machine Company, The 527

Keene Forestry Associates 528
Kelsey Nursery Service 528

Loring, J. Alden 533

Madden, B. L. 533
Maine School of Forestry 532

Neuhart, A. L. 533
New York State School of Forestry 524

Out Door Store, Inc., The 530

Peat Import Corporation 526
Porter, Inc., H. K. 531

Remington Arms Company, Inc. 525

Smith & Company, D. B. 527
Stoeger, Inc., A. F. 533

Tuller Hotel 532

Western Maine Forest Nursery 528
Wiley & Sons, Inc., John 531
Woolrich Woolen Mills 526

WHO'S WHO

Among the Authors in this Issue

Archibald Rutledge

ARCHIBALD RUTLEDGE (*Wildwood Majesty*) paints in this story a prose picture, impressive and startling in its realism, of a monarch of the woods—the wild turkey of the South, as he appears in his native haunts. Imbued with the author's love of nature and his intimate knowledge of the creatures of the wild, this story fully justifies the comment of the late Dr. Henry Van Dyke, when he said: "No man living writes about nature with fuller knowledge or finer feeling than Archibald Rutledge."

A native of South Carolina, Mr. Rutledge was born at McClellansville, in 1883, and his education was completed at Union College, where he was graduated in 1904. Since that year he has headed the English Department at Mercersburg.

STEWART H. HOLBROOK (*The Tragedy of Bandon*) is a writer of Portland, Oregon, whose virile work is known from coast to coast. An old-timer in the logging game and a lover of the forests, he rushed headlong to the scene of the tragic holocaust of the little seacoast town, and gives us here his own vivid story of this latest great fire tragedy.

ROBERT O. FOOTE (*Joshua Tree Forest*) is a writer and editor of long standing. Though born in Iowa, California really claims him, since most of his life has been spent there. An outdoor enthusiast, he tells the story of the unique plant forms found in the Joshua Tree Forest—this most recent member of the National Monument family.

E. C. M. Richards

EDWARD C. M. RICHARDS (*Forestry and Flood Control in the Tennessee Valley*) writes with authority on this subject, for he is Forester for the Tennessee Valley Authority. Mr. Richards is a Yale man, with a splendid background of training and experience both here and abroad. In America he has served as a consulting forester throughout the eastern and southern states, and with the Near East Relief in Persia he made a complete study of the destructive effects of age-long unrestricted lumbering and grazing. Being particularly interested in the social aspects of forest activities as affecting the lives of people, he has traveled and studied these matters in many European countries. Since in the Tennessee Valley is going forward one of the greatest sociological experiments of this era, not only his scientific training but his broad human experience eminently fit Mr. Richards to direct its basic forestry phases.

CATHERINE BARKER (*The Maple*) and EDITH ANISFIELD WOLF of Cleveland, Ohio (*Maturity*), writers of poetry, offer these delightful bits of timely verse.

CONRAD L. WIRTH (*Parks for the Millions*) is Assistant Director of the National Park Service in charge of planning and state cooperation. Born in Connecticut and a graduate of Massachusetts Agricultural College, he claims Minnesota as his home state. An all-round park man, Conrad Wirth was associated, before his appointment to the National Park Service, with the National Capital Park and Planning Commission, where his work was of an executive nature in connection with the acquisition of land for the park system of the Nation's Capital. His familiarity with parks—State and National—fits him particularly well to deal with the general program of the C.C.C. and the E.C.W. in the State and National Parks and Monuments over which he exercises supervision, and of which work he tells so interestingly in "Parks for the Millions."

Conrad Wirth

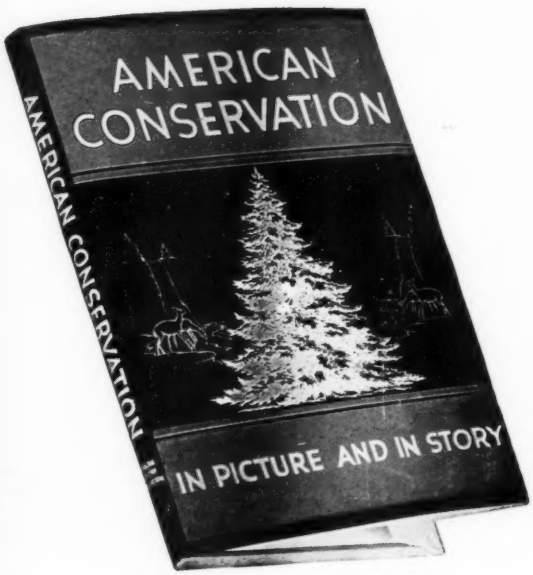
DAREL MCCONKEY (*A North American Marco Polo*) — travel writer, columnist, editor, free lancer — a native of West Virginia—his delightful style is well known to readers of AMERICAN FORESTS. Since coming to the Capital, he has devoted his time exclusively to historical research and writing and is at present enthusiastically engaged as Field Organizer of the Writer's Project of the W.P.A. in the preparation of "The Guide Book of America."

Darel McConkey

EDWARD AVERY MCILHENNY (*Wildlife Has a Sense of Direction*) answers this open question emphatically in the affirmative and what he has to say on any matter pertaining to wildfowl will be of the greatest interest to all conservationists, for there are few men better versed on the subject. A native of Louisiana, he was educated at Holbrook Military Academy and Lehigh University. A lover and student of birds from boyhood, he became known the world over as a traveler, arctic explorer and writer on bird life and game animals.

E. A. McIlhenny

ALETHA M. BONNER (*State Trees*) of Nashville, Tennessee, is a feature and reference writer by profession, devoting her time to creative work in music, nature and inspirational writing. In this issue she tells our boy and girl readers of the officially chosen trees of the various states.



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